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INSIDER TRADING AS A TRANSACTIONAL COST: A MARKET MICROSTRUCTURE JUSTIFICATION AND OPTIMIZATION OF INSIDER TRADING REGULATION

*Nicholas L. Georgakopoulos**

ABSTRACT: This Article offers a direct justification for the regulation of insider trading from an economic perspective using the recently developed financial methodology of market microstructure. Insider trading should be understood as a category of informed trading. Informed trading is, generally, desirable because it promotes efficient pricing. However, lack of competition with other informed traders may allow small groups of informed traders to extract *more profits* than a competitive group of informed traders *without influencing prices as much*. The

* Associate Professor of Law, University of Connecticut School of Law; S.J.D., 1992, Harvard University; L.L.M., 1988, Harvard University. I am deeply indebted to Professor Reinier Kraakman for his invaluable advice, teaching, and support. This Article draws from the second chapter of the author's doctoral dissertation, *A General Theory of Securities Regulation: An Economic Analysis of Securities Fraud, Insider Trading and Corporate Disclosure* (1991) (unpublished doctoral dissertation, Harvard Law School). The comments of Howell Jackson, Louis Kaplow, Lucian Bebchuck, Christine Jolls, and William Klein (from the law and economics perspective); the comments of George Constantinides, Ken Froot, Kathleen Hagerty, Bob Merton, André Perold, Paul Pfleiderer, Lisa Muelbroek, and Eric Sirri (from the perspective of finance); and the comments of the participants in the faculty seminars of George Mason and University of Connecticut Law Schools and the S.J.D. Colloquium at Harvard Law School are gratefully acknowledged.

profits of informed traders take the form of a transaction cost burdening uninformed trading. Insider trading regulation prohibits the informed trading of traders who have monopolistic power over their information and, thus, results in a *reduction of the transaction cost informed trading generates without significantly delaying the correction of prices*. By reducing transaction costs, insider trading regulation promotes liquidity. Liquidity, however, also determines how broad the definition of insider trading should be. Inferential support for these conclusions is drawn from regulatory history.

I. INTRODUCTION

This Article offers a law and economics analysis of insider trading, which builds upon its current theoretical discussion. The prohibition of "insider trading" is the subject of an ongoing debate which began in 1961 soon after the SEC decided *Cady, Roberts & Co.*,¹ which introduced the possibility that securities fraud provisions, primarily Rule 10b-5 and Section 10(b) of the 1934 Securities Exchange Act,² may be violated by trading with "material nonpublic" information. From the law and economics perspective, the initial reaction was that trading with superior information was desirable: informed trading brings new information to the markets causing prices to change toward their "true" value, thus increasing market efficiency and, therefore, promoting the optimal allocation of resources.³ This straightforward argument against

1. *Cady, Roberts & Co.*, 40 S.E.C. 907 (1961).

2. The text of Rule 10b-5 prohibits fraud and requires disclosure:

It shall be unlawful . . . (a) To employ any device, scheme, or artifice to defraud, (b) To make any untrue statement of a material fact or to omit to state a material fact necessary in order to make the statements made, in the light of the circumstances under which they were made, not misleading, or (c) To engage in any act . . . which operates . . . as a fraud or deceit upon any person in connection with the purchase or sale of any security.

17 C.F.R. § 240.10b-5 (1992).

Section 10(b) of the '34 Act, under which the SEC adopted Rule 10b-5, delegates rulemaking power to the SEC for the prohibition of deceptive practices:

It shall be unlawful for any person . . . (b) [t]o use or employ, in connection with the purchase or sale of any security . . . any manipulative or deceptive device or contrivance in contravention of such rules and regulations as the Commission may prescribe

15 U.S.C. § 78j (1988 & Supp. IV 1992).

3. See generally HENRY B. MANNE, *INSIDER TRADING AND THE STOCK MARKET* (1966) (insider trading increases market efficiency because it produces desirable incentives on corporate managers).

the prohibition of insider trading has given the stage to a series of much more complex—and nearly impossible to substantiate—theories about the effect insider trading has on corporate operations and governance.

One such theory argues that, assuming managers are risk averse, insider trading is desirable if it increases managers' risk tolerance up to risk-neutrality in their running of the corporation.⁴ Risk-aversion leads to suboptimal decisions on running the corporation. Participation in the corporation's fate through insider trading, therefore, may ameliorate management's risk preferences. Insider trading may also correct problems due to the payoff structure of managers, who only gain by rises of the corporate fortune and do not lose in failure. The counter-argument to this theory is that compensation plans using options and bonuses to tie management compensation to corporate performance may be more versatile and accurate in bringing about risk-neutrality and curing the perverse incentives that the usual management compensation scheme creates.⁵

A license to trade on "inside" information as part of a management contract is argued also to have the beneficial effect of causing only the best managers to accept such a contract and "signal" their skill.⁶ The

4. *Id.*

5. Incentive compensation plans simulate and even improve upon any beneficial effects of insider trading to firms, particularly because they can be tailored to the risk of the firm so as to avoid discouraging risk-averse managers from accepting the position or encouraging speculative management of the corporation. See Nicholas L. Georgakopoulos, *A General Theory of Regulation of Secondary Securities Markets: An Economic Analysis of Securities Fraud, Insider Trading, and Corporate Disclosure* 183-85 (1991) (unpublished doctoral dissertation, Harvard Law School).

There are two primary quantitative works on the incentive effects of compensation through options and bonuses. See Michael C. Jensen & Kevin J. Murphy, *Performance Pay and Top-Management Incentives*, 98 J. POL. ECON. 225, 261-62 (1990) (concluding that incentives to top management in the form of options and bonuses are surprisingly low, possibly in reaction to political pressures, but not comparing existing incentive compensation plans with insider trading with respect to the effectiveness of the management incentives they produce); Eduardo F. Lemgruber, *Executive Compensation: Implications for Corporate Behavior and Insider Trading* (1986) (unpublished doctoral dissertation, U.C.L.A.) (empirical study indicating that the adoption of incentive compensation plans and the exercise of stock option compensation plans affects the performance of the firm's shares, thus showing that the market regards option plans favorably and that managers do have superior information when they exercise their options early).

6. See Michael J. Carney, *Signalling and Causation in Insider Trading*, 36 CATH. U. L. REV. 863, 886-93 (1987) (insider trading signals competent managers). For a discussion of insider trading and its effect on management, see generally Frank H. Easterbrook, *Insider Trading as an Agency Problem*, in PRINCIPALS AND AGENTS: THE STRUCTURE OF BUSINESS 81 (John W. Pratt & Richard J. Zeckhauser, eds., 1985) (describing the effects of insider trading on the agency relationship); MANNE, *supra* note 3 (insider trading profits are a better management

counter to this signalling argument is obvious: acceptance of contingent pay does not necessarily denote a skilled manager but rather denotes an optimistic or overconfident one. Furthermore, managers, due to their risk-aversion, may not value contingent pay as much as it costs to risk-neutral shareholders and would prefer certainty of compensation. In such a case the signalling argument is reversed into the "lottery-ticket" argument: insider trading as compensation is equivalent to paying with lottery tickets. Since it is undesirable to managers, the best will prefer compensation packages with greater portions of fixed pay.⁷ Furthermore, it is necessary to mention that trading by managers based on information that they acquire or generate in the securities of other corporations (a form of insider trading across corporate boundaries that I have called "cross-trading"⁸) will practically always have detrimental effects on management loyalty.⁹

A different strain of argumentation, which appears in economic literature, attempts to take into account the firm's decision to issue shares or the individual's decision to produce.¹⁰ The present Article

incentive than options or bonuses); Dennis W. Carlton & Daniel R. Fischel, *The Regulation of Insider Trading*, 35 STAN. L. REV. 857 (1983); Frank H. Easterbrook, *Insider Trading, Secret Agents, Evidentiary Privileges, and the Production of Information*, 1981 S. CT. REV. 309 [hereinafter Easterbrook, *Insider Trading, Secret Agents*] (insider trading and the incentives to disclose and produce information); David D. Haddock & Jonathan R. Macey, *A Coasian Model of Insider Trading*, 80 NW. U. L. REV. 1449 (1986); Kenneth E. Scott, *Insider Trading: Rule 10b-5, Disclosure and Corporate Privacy*, 9 J. LEGAL STUD. 801 (1980); Lucian Arye Bebchuck & Chaim Fershtman, *The Effects of Insider Trading on Insiders' Choice Among Risky Investment Projects* (Sept., 1990) (unpublished Discussion Paper No. 75, Program in Law and Economics, Harvard Law School) (unfettered insider trading ensures that managers will make the value-maximizing choices); Lucian Arye Bebchuck & Chaim Fershtman, *The Effect of Insider Trading on Insiders' Reaction to Opportunities to "Waste" Corporate Value* (Sept., 1990) (unpublished Discussion Paper No. 76, Program in Law and Economics, Harvard Law School) (unfettered insider trading leads managers to waste corporate assets).

7. See Easterbrook, *Insider Trading, Secret Agents*, *supra* note 6, at 332; Scott, *supra* note 6, at 808.

The signalling and the lottery ticket arguments do not necessarily lie on opposite assumptions about managers' risk-preferences. Given different risks of individual firms, the signalling argument may be valid if the share price of the firm is relatively stable and not subject to random shocks outside the control or knowledge of management. In high-risk industries, by contrast, the lottery ticket paradigm seems much more forceful. What changes is the risk of the compensation, not the risk-preferences of managers. See Georgakopoulos, *supra* note 5, at 184-87.

8. See Nicholas L. Georgakopoulos, *Classical and Cross Insider Trading: Variations on the Theme of Rule 10b-5*, 28 AM. BUS. L.J. 109 (1990).

9. Notice, however, that this argument fails to justify regulation opposite the Coase theorem. Firms should have sufficient incentives to prohibit and, in fact, do prohibit cross-trading on their own initiative.

10. This argument has been expounded upon by a number of commentators. Lawrence

shows that it is not necessary to consider investment decisions by firms in the debate on insider trading, the causal relation of which is probably too remote anyway.¹¹ Moreover, the articles that advocate this theory assume an *a priori* definition of insiders and, therefore, do not address the issue of the optimal breadth of the definition of insiders. By contrast, this Article not only argues for the desirability of regulation using the empirically proven dynamics of trading, but also tries to determine the optimal definition of insider trading.¹²

Ausubel points out that the fear of insider trading leads to underproduction by outsiders and that the promise of no insider trading allows outsiders to produce and increase their own as well as the insiders' welfare. See Lawrence M. Ausubel, *Insider Trading in a Rational Expectations Economy*, 80 AM. ECON. REV. 1022 (1990). Notice that from the Coase theoretical perspective, Ausubel's argument does not favor regulation since it is to both the insiders' and the outsiders' advantage to restrict the practice.

Hayne Leland has built a model with two classes of informed traders, insiders and outsiders, as well as liquidity traders, and has included the firm's decision to raise capital. Insider trading may be either desirable or undesirable depending on several factors. Notably, insider trading is less desirable as the flexibility of raising new capital decreases. See Hayne E. Leland, *Insider Trading: Should it be Prohibited?*, 100 J. POL. ECON. 859 (1992).

In his work on the subject, Michael Manove points out that discounting by outsiders for the danger of insider trading affects the internal investment decisions of firms, leading to over-investment in order to lower the variance of the outcome of the investment and, therefore, lessen the danger of insider trading and the discount by outsiders. This argument is reversed and leads to under-investment if the variance of the outcome of corporate investment is so high that it cannot be lessened through additional investment. See Michael Manove, *The Harm from Insider Trading and Informed Speculation*, 104 QJ. ECON. 823 (1989).

The conclusions of Leland, *supra*, come relatively close to those of this Article. Leland's model, however, is extremely stylized and, being a microeconomic model, is insufficiently close to the trading action. By contrast, the analysis of this Article is founded on the trade-by-trade examination of the interaction of traders that market microstructure makes possible.

11. The reason for the remote relevance of arguments premised on the effect insider trading has on prices is associated with the puzzle of the "risk premium," i.e., the excess return of equity over debt after adjusting for risk. Rajnish Mehra and Edward Prescott justify a minuscule portion of the superior returns of equity by risk. Arguments premised on the influence of insider trading on prices are therefore unlikely, particularly since insider trading will not nearly eliminate the 20% volatility that justifies that small portion of the equity premium. See Rajnish Mehra & Edward C. Prescott, *The Equity Premium: A Puzzle*, 15 J. MONETARY ECON. 145 (1985); Stephen John Fisher, *Asset Trading, Transaction Costs and the Equity Premium* (July 1991) (unpublished manuscript, on file with author). In contrast to Mehra and Prescott, who point out that risk only explains 0.4% of the 6-8% historical equity premium, Fisher uses transaction costs to justify 4%, i.e. over half of the equity premium. *Id.* at 13-14, 20. For the effect of transaction costs, see *infra* note 69.

12. A seemingly related analysis of insider trading using microstructure tools was also attempted by Albert Kyle. See Albert S. Kyle, *Continuous Auctions and Insider Trading*, 53 ECONOMETRICA 1315 (1985). Kyle's work, however, analyzes the strategy of insiders who are faced with an end to trading and does not consider the possibility of changes in their numbers and their competition. While Kyle finds that insiders, still exogenously defined, correct prices at the end of trading, this finding has little impact on the regulation of insider trading. Properly

Previous authors have insinuated that insider trading may have detrimental effects on market liquidity.¹³ In essence, the profits of informed traders are the losses of the uninformed, who avoid trading to avoid those losses. This observation, which is explained in Part III(A), however, is insufficient to justify a prohibition of insider trading unless it were possible to ban all informed trading. Banning all informed trading is not only impossible, since it would require the unenforceable ban of trading on public information, but also undesirable since informed traders are necessary to make prices accurate so that the market allocates resources optimally.

Commentators have suggested that insider trading restrictions promote the interests of the professional investment community, which is comprised of the by-default informed traders, since corporate insiders are prohibited from trading.¹⁴ One can infer that according to this view, the prohibition of insider trading is pointless because the same profits that the insiders would reap accrue in favor of the professional investment community, and uninformed investors are no better off.

This Article, in justifying the prohibition of insider trading, rebuts the notion that insider trading rules simply shift the profits of informed trading without reducing them. This Article argues that the prohibition of trading by a narrow group of informed traders ("insiders") that leaves a broader group as the first informed traders (say, investment analysts) causes more competition among informed traders, which in turn reduces their aggregate profits. A reduction in the profits of informed traders reduces the quasi-transaction cost that burdens unin-

understood, the end of trading for Kyle's insiders happens only if trading in the corporation ceases permanently, e.g., if the corporation is de-listed from the exchange, or if it is liquidated in a Chapter Seven proceeding (as opposed to a Chapter Eleven reorganization, where the insider's knowledge retains its importance in the surviving reorganized entity). The date of public disclosure is not equivalent to the end of trading in Kyle's model because the insiders can still trade after the disclosure of their information, since they will still have greater familiarity with it. Both empirical evidence and theoretical work support this analysis and refute Kyle's conclusions. See *infra* note 61.

The competition among informed traders is also considered by the seminal article written by Admati and Pfleiderer. See Anat R. Admati & Paul Pfleiderer, *A Theory of Intraday Patterns: Volume and Price Variability*, 1 REV. FIN. STUD. 3 (1988). Their model, however, does not examine legal constraints upon informed trading and, therefore, although very closely related, does not address the issue of the desirability of an insider trading prohibition.

13. See Paul Fenn et al., *Information Imbalances and the Securities Markets*, in EUROPEAN INSIDER DEALING 3, 8 (Klaus J. Hopt & Eddy Wymeersch eds., 1991) (briefly referring to information asymmetry and adverse selection as sources of transaction costs, primarily through their effect on the bid-ask spread).

14. See Haddock & Macey, *supra* note 6, at 1458-59.

formed trading, and, therefore, promotes market liquidity. In this sense, this Article justifies insider trading regulation for the first time.¹⁵ An understanding of this justification, i.e., that the prohibition of insider trading increases the number of informed traders and intensifies their competition, allows for optimization of the regulation.

This Article further argues that insider trading is a transaction cost burdening outsiders who trade in securities markets.¹⁶ A significant purpose of securities regulations is, thus, regulation of transaction costs. The existence of regulation of transaction costs in the securities markets is justified by the peculiar but important role that the interaction of informed and uninformed traders plays in securities pricing. Because this setting is distinguishable from the pricing of non-financial goods, the increased protection created by securities regulation is justifiably limited to the securities markets.

Part II of the Article, which provides a summary of the law on insider trading, emphasizes that insider trading is not synonymous with informed trading: the prohibition of insider trading prohibits the trading of only some informed traders, allowing market participation by informed non-insiders; while the presence of uninformed traders is shown to be unavoidable and irrefutable. Part III examines the interaction of informed and uninformed traders generally. In this context, Part III(A) explains how the profits of informed traders are a cost to the uninformed and asks whether this cost may be reduced by regulatory measures. Part III(B) examines insider trading regulation as a means to reduce the disadvantage (cost) of uninformed trading and gives a Coase-theoretical justification for the regulation of insider trading. Part III(C) attempts to balance costs and benefits of regulating informed

15. In contrast to the inconclusive theoretical debate, legal practice has almost unanimously favored the prohibition of insider trading, considering it an "unfair" practice. See, e.g., Victor Brudney, *Insiders, Outsiders, and Informational Advantages Under the Federal Securities Laws*, 93 HARV. L. REV. 322 (1979); Roy A. Schotland, *Unsafe at Any Price: A Reply to Manne, Insider Trading and the Stock Market*, 53 VA. L. REV. 1425, 1441-42 (1967) (providing various statements relating investor confidence to the proscription of insider trading) (citing *Report of the Special Committee on Securities Laws and Regulations*, 66 A.B.A. REP. 340, 357 (1941); Symposium, *Insider Trading in Stocks*, 21 BUS. LAW. 1009, 1010 (1966); Deter F. Vagts, *Reforming the "Modern" Corporation: Perspectives from the German*, 80 HARV. L. REV. 23, 27 (1966)). Schotland's article can also be read as giving a concrete law and economics explanation—or translation—of the intuition of "unfairness" invoked by practitioners.

16. A closely related point has been made by William Wang. See William K.S. Wang, *Trading On Material Nonpublic Information on Impersonal Stock Markets: Who is Harmed and Who Can Sue Whom Under SEC Rule 10b-5?*, 54 S. CAL. L. REV. 1217, 1234-35, 1247-48 (1981). This, however, was done before the financial tools for further analysis of these transaction costs were developed.

trading in order to find the optimal rule on insider trading. Part IV offers inferential support for the theory of this Article, based on the history of international and United States regulatory policy. The Article concludes by pointing out that insider trading rules are complemented by the regulations forcing corporations to disclose information.

II. DISTINGUISHING INSIDER TRADING FROM INFORMED TRADING

This Article turns on the notion that the prohibition of "insider trading" is a way to regulate informed trading. Informed trading is desirable because it promotes accurate pricing of securities. Only some informed traders fall under definition of "insiders." Part II(A) offers a brief exposition of the law on insider trading. Part II(B) shows that the definition of insider trading encompasses only a small number of informed traders.

A. *Insider Trading Law*

There are several sources of insider trading liability. Liability first arises from the explicit statutory prohibitions set forth in section sixteen of the Securities Exchange Act of 1934¹⁷ and in Rule 14e-3,¹⁸ which the SEC has promulgated thereunder. In addition to the statutory sources, there are three other theories which support the imposition of liability for insider trading: the recognition of the "duty to disclose or

17. The relevant text of § 16(b) reads:

(B) PROFITS FROM PURCHASE AND SALE OF SECURITY WITHIN SIX MONTHS

For the purpose of preventing the unfair use of information which may have been obtained by [a 10%] beneficial owner, director, or officer by reason of his relationship to the issuer, any profit realized by him from any purchase and sale, or any sale and purchase . . . within any period of less than six months . . . shall inure to and be recoverable by the issuer

15 U.S.C. § 78p (b) (1988).

18. The text of Rule 14e-3 limits its application to tender offers:

(a) If any person has taken a substantial step or steps to commence, or has commenced, a tender offer (the "offering person"), it shall constitute a fraudulent, deceptive or manipulative act or practice within the meaning of section 14(e) of the Act for any other person who is in possession of material information relating to such tender offer which information he knows or has reason to know is nonpublic and which he knows or has reason to know has been acquired directly or indirectly from:

(1) The offering person,
 (2) The issuer of the securities sought or to be sought by such tender offer, or
 (3) Any officer, director, partner or employee or any other person acting on behalf of the offering person or such issuer, to purchase or sell or cause to be purchased or sold any of such securities

17 C.F.R. § 240.14e-3 (1992).

abstain" owed by certain insiders; the belief that insider trading represents a type of misappropriation akin to stealing; and the argument that insider trading is a violation of mail and wire fraud statutes.

1. Statutory Prohibitions

The statutory prohibitions are of little theoretical interest. Rule 14e-3 prohibits trading with takeover information. Although its validity was briefly put into question by *United States v. Chestman*,¹⁹ Rule 14e-3 is correct from an economic perspective since trading with information about takeovers, even if it were to influence prices, does not further optimal resource allocation, neither in saving, spending, nor investment decisions. Section sixteen, on the other hand, does not prohibit insider trading but simply averts short-swing (short-term) trading and short-selling by managers in the stock of their own corporation. Section sixteen also requires reporting to facilitate its enforcement.²⁰ The SEC has defined insider trading for the purpose of section sixteen, and this definition was recently expanded, illustrating the fact that even the "statutory insiders" of section sixteen are subject to a flexible definition.²¹

2. Non-statutory Prohibitions

a. *The "Duty to Disclose or Abstain" Theory*

The original non-statutory theory used against insider trading was

19. 903 F.2d 75 (2d Cir. 1990), *vacated*, 947 F.2d 551 (2d Cir. 1991) (en banc), *cert. denied*, 112 S. Ct. 1759 (1992). The panel deciding *Chestman* on the first appellate hearing split with respect to Rule 14e-3. Judge Miner opined that the rule was valid within the rulemaking authority of § 14(e) because it is not "inconsistent with the statutory mandate." *Id.* at 83 (quoting *Federal Election Comm'n. v. Democratic Senatorial Campaign Comm.*, 454 U.S. 27, 32 (1981)). Judge Miner read Rule 14e-3 as not requiring breach of a fiduciary duty in the creation of a duty to "disclose or abstain." *Id.* at 83. Judge Mahoney opined that the SEC "exceeded its statutorily granted authority by promulgating rule 14e-3 without including any requirement of a breach of fiduciary duty." *Id.* at 84. Judge Mahoney would not uphold the rule. *See id.* at 85 n.1. Judge Carman found the rule to be valid but required that it be read as including a fiduciary violation requirement. *Id.* at 88. By contrast, the en banc panel found Rule 14e-3 to be within the SEC's rulemaking authority, and applied it as written, that is, without requiring a fiduciary breach. *United States v. Chestman*, 947 F.2d 551, 557, 563 (2d Cir. 1991) (en banc), *cert. denied*, 112 S. Ct. 1759 (1992).

20. Insider short-selling receives a slightly different treatment in that it is barred by § 16(c). 15 U.S.C. § 78p(c) (1988).

21. Rules 16b-1 through 16b-8 were amended, and Rules 16b-9 through 16b-11 were removed, effective May 1, 1991. The effect of the change was to expand the definition of "insiders" to include individuals who have access to information but who rank lower on the corporate ladder. 17 C.F.R. §§ 240.16b-1 to -8 (1992).

based on the concept that the insider and the person on the other side of the insider trade have a fiduciary relationship. Being a fiduciary, the insider must disclose his information or face liability analogous to that for deceit by concealment. This "duty to disclose or abstain" from a transaction of conflicting interests is founded on securities fraud rules.

In *Chiarella v. United States*,²² the seminal case on insider trading law, the Supreme Court stated quite clearly that the source of a duty to disclose must be a relationship of trust between the trader and his counterpart. *Chiarella* involved a suit against the printer for several acquiring corporations. The printer decoded information concerning the acquisitions and traded in the stock of the target companies. In exonerating the printer, the Court stated:

No duty [to disclose] could arise from petitioner's relationship with the sellers of the target company's securities, for petitioner had no prior dealings with them. He was not their agent, he was not a fiduciary, he was not a person in whom the sellers had placed their trust and confidence. He was, in fact, a complete stranger²³

The common law principles barring deceit and misrepresentation are clearly discernible in the *Chiarella* decision. Management and shareholders of the same corporation are bound by fiduciary ties. Trading by management based on knowledge that is unavailable to shareholders involves a conflict of management's interests. Because of the bond of trust, managers have a duty to disclose their information.²⁴ Their silence constitutes fraudulent concealment of information and is in violation of Rule 10b-5.

The problem with the "duty to disclose or abstain" theory of liability is that it is exceptionally narrow. Insider trading, as defined by the theory, can only take place between shareholders and insiders of the

22. 445 U.S. 222 (1980).

23. *Id.* at 232-33.

24. Compare the analogous provision of the Restatement (Second) of Torts. Section 551(2)(e) reads:

(2) One party to a business transaction is under a duty to exercise reasonable care to disclose to the other before the transaction is consummated,

. . . .

(e) facts basic to the transaction, if he knows that the other is about to enter into it under a mistake as to them, and that the other, because of the relationship between them, the customs of the trade or other objective circumstances, would reasonably expect disclosure of those facts.

RESTATEMENT (SECOND) OF TORTS § 551(2)(e) (1977).

same corporation. This, however, has not always been the case. Previous cases have held that all holders of material nonpublic information are bound by a fiduciary relationship to all investors, an interpretation known as the "equal access" theory.²⁵ Thus, under the duty to disclose or abstain theories, as under section sixteen, the definition of insiders is flexible.

b. Insider Trading as the Stealing of Information: The Misappropriation Theory

This misappropriation theory considers profitable insider trading to be stealing.²⁶ In establishing the misappropriation theory, the Second Circuit, in *United States v. Newman*,²⁷ quoted Chief Justice Burger's dissent in *Chiarella*. The court stated that "the defendant 'misappropriated—stole to put it bluntly—valuable nonpublic information entrusted to him in the utmost confidence.'"²⁸ *Newman*, however, does not make clear whether it is the stealing of the information or the breach of the relationship of the trader with the source of his information that constitutes securities fraud. The indictment's wording indicates that the latter was the primary factor in the court's decision, and, thus, the misappropriation theory can be viewed a hybrid between the duty to disclose or abstain theory and the "stealing" theory based mail and wire fraud statutes. If, however, the former is true, and the "stealing" theory was the prime motivator, the misappropriation theory and the mail and wire fraud theory of insider trading liability are identical.

25. See *SEC v. Texas Gulf Sulphur Co.*, 401 F.2d 833, 848 (2d Cir. 1968) (en banc) (Rule 10b-5 "is based in policy on the justifiable expectation of the securities marketplace that all investors trading on impersonal exchanges have relatively equal access to material information . . ."), *cert. denied*, 394 U.S. 976 (1969). *Chiarella v. United States*, 445 U.S. 222 (1980), marked the end of that period. Justice Blackmun's dissent in *Chiarella* supported the dying theory of equal access to information. See *id.* at 249-50 (Blackmun, J., dissenting) (citing *Texas Gulf Sulphur*, 401 F.2d at 848; *Lewelling v. First California Co.*, 564 F.2d 1277, 1280 (9th Cir. 1977); *Speed v. Transamerica Corp.*, 99 F. Supp. 808, 829 (D. Del. 1951)). See also *United States v. Chiarella*, 588 F.2d 1358, 1365 (2d Cir. 1978), *rev'd*, 445 U.S. 222 (1980); *United States v. Charnay*, 537 F.2d 341, 349-50 (9th Cir. 1976) ("[T]he duty to disclose material information is based on a potential manipulator's duty to the investing public as a whole as well as to particular shareholders."), *cert. denied*, 429 U.S. 1000 (1976).

26. Similarly, the mail and wire fraud theory of liability discussed in Part II(A)(2)(c), *infra*, is founded on the concept that the trader steals business information.

27. 664 F.2d 12, 17 (2d Cir. 1981), *cert. denied*, 464 U.S. 863 (1983).

28. *Id.* at 17 (quoting *Chiarella*, 445 U.S. at 245).

c. *Insider Trading as the Stealing of Information: The Mail and Wire Fraud Theory*

Courts, when applying mail and wire fraud statutes to insider trading cases, usually base their decisions on the theory that "confidential business information" is property. The traders' profiting on the information through insider trading then becomes a deceptive scheme, as set forth in the mail and wire fraud statutes.²⁹

29. The mail and wire fraud statutes are designed to reach all "fraudulent" activity that may use the mail, the wires or radiowaves. They are drafted with the same extremely expansive "catchall" notion of the securities fraud provisions. In one long-winded sentence, the United States Code makes it a criminal offense to use the mails (1) to further a scheme to defraud, (2) to obtain money or property using false pretenses, or (3) to distribute counterfeit currency:

Whoever, having devised or intending to devise any scheme or artifice to defraud, or for obtaining money or property by means of false or fraudulent pretenses, representations, or promises, or to sell, dispose of, loan, exchange, alter, give away, distribute, supply, or furnish or procure for unlawful use any counterfeit or spurious coin, obligation, security or other article, or anything represented to be or intimated or held out to be such counterfeit or spurious article, for the purpose of executing such scheme or artifice or attempting so to do, places in any post office or authorized depository for mail matter, any matter or thing whatever to be sent or delivered by the Postal Service, or takes or receives therefrom, any such matter or thing, or knowingly causes to be delivered by mail according to the direction thereon, or at the place at which it is directed to be delivered by the person to whom it is addressed, any such matter or thing, shall be fined not more than \$1,000 or imprisoned not more than five years, or both. If the violation affects a financial institution, such person shall be fined not more than \$1,000,000 or imprisoned not more than 30 years or both.

18 U.S.C. § 1341 (Supp. IV 1992). See *United States v. Carpenter*, 791 F.2d 1024, 1034-35 (2d Cir. 1986) ("It is clear that 'confidential and nonpublic commercial information' may constitute fraudulently misappropriated 'property' under the mail fraud statute."), *aff'd*, 484 U.S. 19 (1987); *Newman*, 664 F.2d at 19-20 ("[The indictment] clearly charges appellee with fraudulent misappropriation of property that did not belong to him. Intangibles such as 'confidential and nonpublic commercial information' fall within the definition of 'property' under the mail fraud statute.") (citing *United States v. Kelly*, 507 F. Supp. 495, 499-504 (E.D. Pa. 1981); *United States v. Von Barta*, 635 F.2d 999, 1006 (2d Cir. 1980), *cert. denied*, 450 U.S. 998 (1981); *United States v. Louderman*, 576 F.2d 1383, 1387 (9th Cir. 1978), *cert. denied*, 439 U.S. 896 (1978); *United States v. Brown*, 540 F.2d 336, 374 (2d Cir. 1977)).

The *Newman* court supported its definition of property by noting that confidential business secrets are specifically protected in a number of criminal statutes. *Newman*, 664 F.2d at 19 n.4.; see, e.g., 18 U.S.C. § 1702 (1988); N.Y. Penal Law, §§ 155.00 & 155.30(3) (McKinney 1988); see also *United States v. Victor Teicher & Co.*, 726 F. Supp. 1424, 1433-34 (S.D.N.Y. 1989); *United States v. Reed*, 601 F. Supp. 685 (S.D.N.Y. 1985), *rev'd*, 773 F.2d 477 (2d Cir. 1985).

The advance of mail and wire fraud insider trading liability has suffered only one minor setback. In *United States v. Chestman*, 947 F.2d 551, 571 (2d Cir. 1991) (en banc), *cert. denied*, 112 S. Ct. 1759 (1992), the court, although in the context of aiding and abetting in mail and wire fraud, refused to find constructive knowledge of the confidentiality of the information provided to the defendant broker by a close relative of the owner of the corporation that was being sold.

In 1987, the Supreme Court decided *McNally v. United States*,³⁰ which narrowed the applicability of the mail and wire fraud statutes to the taking of "property" instead of the taking of any entitlement. The Court soon clarified *McNally* with its decision in *Carpenter v. United States*.³¹ *Carpenter* removed any doubt that mail and wire fraud statutes might be inapplicable to insider trading, by including "intangible property" in the *McNally* definition of property. *Carpenter* involved the trading by a *Wall Street Journal* columnist on the future content of his column. The *Wall Street Journal*'s confidential business information was elevated to a property right, and the mail and wire fraud convictions of the defendants were upheld unanimously.³²

The misappropriation theory involves a determination of what types of relationships preserve the confidentiality of information. Once such a relationship is established, any trading of confidential information is a "misappropriation." In contrast, the mail and wire fraud theory involves a determination of whether the source of the confidential information protected it adequately to elevate his or her interest to a "property right." The facts of *Newman* and of *Carpenter* fall almost squarely within the limits of each theory.³³ Less intuitive settings may involve the doctor-patient relationship,³⁴ or relationships among family members.³⁵ Once more, the flexibility of the definition of insider trading is

30. 483 U.S. 350 (1987). The Court exonerated a public official who was prosecuted under the mail and wire fraud statutes, reasoning that he "stole" the right to "good government" from his constituents. *Id.* at 360. The Court held that the mail and wire fraud statutes apply to "property rights" only, not to entitlements, such as the entitlement to good government. *Id.*

31. 484 U.S. 19 (1987).

32. *Id.* at 28.

33. In *Carpenter*, for example, the Court emphasized that the *Wall Street Journal* had prohibited its employees from trading on its information: "The official policy and practice at the Journal was that prior to publication, the contents of the column were the Journal's confidential information [The defendant] was familiar [with the rule]." *Carpenter*, 484 U.S. at 23.

34. *United States v. Willis*, 737 F. Supp. 269 (S.D.N.Y. 1990).

35. *United States v. Reed*, 601 F. Supp. 685 (S.D.N.Y. 1985) (son found guilty of insider trading under mail and wire fraud theory of liability for information he received from his father, a corporate director, based on finding that the father-son relationship was sufficiently confidential to support the proposition that the son "defrauded" his father by trading on the information). The Second Circuit touched upon the circumstances where a familial relationship would support a finding of a fiduciary relationship in *United States v. Chestman*, 947 F.2d 551 (2d Cir. 1991) (en banc), cert. denied, 112 S. Ct. 1759 (1992). The court distinguished *Reed* on the grounds that *Reed* involved repeated confidences, which may be sufficient to create the "functional equivalent" of a fiduciary duty: "[W]e limit *Reed* to its essential holding: the repeated disclosure of business secrets between family members may substitute for a factual finding of dependence and influence and thereby sustain a finding of the functional equivalent of a fiduciary relationship." *Id.* at 569. The court ruled that there must be a pattern of sharing business secrets

apparent.

Under all of the above theories of insider trading liability, the breadth of the definition of "insider trading" depends significantly on interpretation. The fiduciary breach that gives rise to the "duty to disclose or abstain" theory of insider trading liability will result in a much broader definition if a fiduciary relationship is found to connect all market participants to privately informed traders, as was the case under the "equal access" theory.³⁶

Under the misappropriation theory, the scope of insider trading depends on the range of relationships that require the recipient to maintain the confidentiality of information. Similarly, interpretation is also involved in determining the breadth of insider trading under the mail and wire fraud statutes; liability hinges on the definition of information as property.

In sum, insider trading is clearly prohibited under three primary legal theories. The first, under which insider trading is a breach of management's fiduciary duties to shareholders, defines insiders quite narrowly as managers and other corporate agents trading in the stock of their employer corporation. The misappropriation theory and the mail and wire fraud theory are founded on the notion that an employer's information is stolen when an employee trades on it. These latter two theories have a wider reach, since they apply to all individuals trading for their own account if they are using their employer's information. The definitions of insider trading under the three primary theories, as well as under the statutory prohibition of section sixteen, have variable breadth. Wider definitions would reach more informed traders, and narrower definitions would reach fewer. That some informed trading does not fall under the current definitions shows that insider trading rules currently disallow only part of informed trading.

B. *The Existence of Informed Non-Insiders and Uninformed Traders*

Among the non-insiders, many individuals trade for the purpose of taking advantage of superior information. This group thus consists of "informed" traders. The trading of other non-insiders is not motivated

before a fiduciary relationship can be found. More importantly, frequent sharing of secrets is only a substitute for dependence and influence, which, in the court's opinion, are the essential elements of a fiduciary relationship. *Id.* The court made no further inroads, however, toward the determination of when a familial relationship constitutes a fiduciary relationship.

36. See *supra* note 25.

by 'information. This group consists of "uninformed" traders. The purpose of distinguishing insiders from both "informed" traders and from "uninformed" traders is to show that insiders are merely a subset of the informed. It is the interaction between informed and uninformed traders that is critical in determining whether some informed traders should be prohibited from trading.

Numerous cases show that using private information alone does not give rise to liability for insider trading.³⁷ Consider, for example, *Dirks v. SEC*,³⁸ where an investment analyst received private information from ex-employees of Equity Funding Corporation, an insurance company. Dirks and his clients traded on the information and were prosecuted, but the Supreme Court exonerated them. Although this Article stresses that exclusive holders of information should be prohibited from trading,³⁹ the relevance of *Dirks* here is that informed traders can trade legally. As the Court noted: "Imposing a duty to disclose or abstain solely because a person knowingly receives material nonpublic information from an insider and trades on it could have an inhibiting influence on the role of market analysts, which the SEC itself recognizes is necessary to the preservation of a healthy market."⁴⁰

Thus, the Supreme Court has recognized both the need for, and the existence of, informed traders. Financial theory does not disagree. Efficient markets do not preclude informed trading. Not only is there proof that private information can be used to the traders' advantage, but also, fluctuations in the trading volume do move prices, creating trading opportunities for their correction. Empirical evidence shows both that legitimate Section Sixteen insiders outperform the market (and are therefore "informed") and that on the New York Stock Exchange, prices

37. See *Dirks v. SEC*, 463 U.S. 646 (1983); *Rosenbloom v. Adams, Scott & Conway, Inc.*, 552 F.2d 1336 (9th Cir. 1977) (the mere fact that a person occupies a position on organizational chart of corporation does not establish that he is an insider as matter of law); *American General Ins. Co. v. Equitable General Corp.*, 493 F. Supp. 721 (E.D. Va. 1980) (officers of corporation that repurchased its own shares from large stockholder prior to merger are insiders but are not liable to stockholder for nondisclosure of merger if they do not act in their own interest but for all shareholders, but officers are under duty to disclose merger information if they have made a statement which requires disclosure of further information in order not to be misleading). But see *Green v. Hamilton Int'l. Corp.*, 437 F. Supp. 723, 728-29 (S.D.N.Y. 1977) (insider trading liability may attach to corporation that allowed convertible debt to expire shortly before merger if it concealed material information in this transaction with intent to defraud plaintiffs). *Green* opens the issue of a fiduciary duty to holders of convertible bonds, which raises doubts about the propriety of the decision. See *id.* at 729 n.4.

38. 463 U.S. 646 (1983).

39. See *infra* note 92 and accompanying text.

40. *Dirks*, 463 U.S. at 658 (footnote omitted).

move with supply and demand shocks, thus giving rise to "inefficient" prices. These prices are, however, corrected within five to fifteen minutes.⁴¹

The existence of uninformed traders is not hard to prove. The legal system itself provides for forced liquidations in the various forms of receivership. Trading without any attempt to exploit information, however, is much more frequent. A portion of daily trading volume is "index arbitrage," a trading strategy that combines purchases of the stocks that make up an index and sales of the futures contracts for the index (or vice-versa). Profits are achieved through price differences.⁴² Index arbitrage is not a "real" transaction in the sense that the number of shares the arbitrageur buys is equal to the number of futures he sells. Both "legs" of the trade are uninformed: the arbitrageur does not bet on a price movement.⁴³ Other dominant uninformed trades are those of "portfolio insurance" or other "dynamic hedging" and "synthetic" instrument strategies, where trading is automatically triggered by market moves.⁴⁴ Similarly uninformed, but less prevalent, is the trading of index funds, which simply involves purchases of stocks that are part of an index, and the trading of ordinary mutual funds, which occurs when redemptions and new subscriptions by clients do not cancel out.

41. See generally JAMES H. LORIE ET AL., *THE STOCK MARKET: THEORIES AND EVIDENCE* *passim* (2d ed. 1985) (collecting empirical work).

42. Index arbitrage is defined as follows:

(ii) "[I]ndex arbitrage" means an arbitrage trading strategy involving the purchase or sale of a "basket" or group of stocks in conjunction with the purchase or sale, or intended purchase or sale, of one or more cash-settled options or futures contracts on index stock groups, or options on any such futures contracts (collectively, "derivative index products") in an attempt to profit by the price difference between the "basket" or group of stocks and the derivative index products. While the purchase or sale of the stocks must be in conjunction with the purchase or sale of derivative index products, the transactions need not be executed contemporaneously to be considered index arbitrage.

N.Y.S.E. Rule 80A(e)(ii), 2 NYSE Guide (CCH) ¶ 2080A (Oct. 19, 1988). Index arbitrage has been considered to have the potential to induce undesirable excess volatility of stock prices. In response to this, the New York Stock Exchange passed Rule 80A, which, in addition to defining index arbitrage, places some restrictions on its use. N.Y.S.E. Rule 80A(c)-(d), (e)(ii).

43. Whether prices rise or fall is irrelevant to the index arbitrageur. His profits come from the unavoidable narrowing of the difference between the cash and the futures prices.

44. For example, an option to buy stock at a certain price can be recreated, i.e. "synthesized," by automatically buying that amount of stock as the price rises and passes the option price. See generally JOHN HULL, *OPTIONS, FUTURES AND OTHER DERIVATIVE SECURITIES* *passim* (1989).

III. THE JUSTIFICATION OF REGULATING INFORMED TRADING BY PROHIBITING INSIDER TRADING

Part II described insider trading law and pointed out that the law does not forbid all informed trading. The regulation of insider trading consists of a *partial prohibition* against informed trading — a prohibition against trading by only those informed traders whom the law labels “insiders.” If the regulation of insider trading is an issue of definitions, one can easily imagine wider as well as narrower definitions of “insiders.” This section uses this understanding and analyzes the prohibition of insider trading as a type of regulation of informed trading.

Informed trading, as is generally conceded, is beneficial because it promotes accurate securities prices. Nevertheless, maybe some informed trading should be prohibited. Part III(A) first explains that informed trading, despite its beneficial nature, generates a cost. Informed traders “take” part of the stock market returns from the uninformed traders. Uninformed traders can avoid this by not trading. This “taking” thus resembles a transaction cost since it can be avoided by not trading. Part III(B) then argues in favor of the prohibition against insider trading. Different classes of informed traders “take” different amounts in transforming their information into trading profits. The amount of profits that a class of informed traders reaps depends on how competitively the class trades. Monopolistic informed traders extract large profits without much beneficial adjustment of prices. Therefore, the prohibition of their trading by calling them “insiders” is desirable. Furthermore, regulation is necessary because neither the firms nor shareholders face sufficient incentives to prohibit insider trading themselves. Part III(C) will explain the cost/benefit analysis that leads to the optimal insider trading rule.

A. *The Transaction Cost Generated by Informed Trading*

1. Insiders' Profits as Outsiders' Costs of Trading

Insiders gain at the expense of outsiders because they take advantage of price movements. The result is that their profits take the form of a transaction cost burdening outsiders. The cost to the group of outsiders is equal to the total profits of insiders. If insiders outperform the market by \$100, outsiders as a group trail the market by \$100. The expected cost of each transaction by a member of a group is this loss divided by the number of outsider transactions. Thus, if insiders beat the market by \$100 in a period during which outsiders made 100 trades, the outsiders bore a cost of expecting to trail the market by \$1

for each trade.⁴⁵

Trades by outsiders against outsiders, despite the fact that one side profits at the other's expense, do not influence the calculation. As far as outsiders as a group are concerned, the profits of some cancel out the losses of others. Since the transactions are not motivated by information but are random, the expected profit or loss from them is zero.

The losses of the outsider group are caused by the fact that insiders take advantage of price movements. If a group of traders participated equally in all price moves, the group would perform as well as the market. Insiders, however, cause outsiders as a group to hold less stock before price rises and more before price drops. An example may clarify how outsiders lose as much as insiders gain. Assume a firm with a total capitalization of \$100, \$90 of which are held by outsiders and \$10 by insiders. Insiders, predicting a price drop, sell \$5 of their holdings, resulting in their holding \$5 for the outsiders' \$95. Insiders' expectations materialize and the market falls 20%, leaving outsiders with 95% of \$80, or \$76, and insiders with \$4. Insiders readjust their holdings to 10% (\$8) and participate with the initial ratio in dividends until they predict a price rise, whereupon they increase their holdings to 15% (\$12). The market rises, returning to its original \$100 level. Insiders now hold \$15 and outsiders \$85. In the course of the two price moves insiders first avoided losing \$1 and, subsequently, gained \$1 extra by trading on their information. Thus outsiders trail the market by \$2, and

45. The same effect will exist in a market with market makers, but it will be less pronounced. In a market where the participants transact among themselves, the "losses" of the uninformed are by necessity equal to the profits of the informed. The interjection of a market maker (who stands ready to trade with anyone at the bid or ask prices that the market maker sets) complicates the picture because he acts as a "buffer" between the informed and uninformed. Whenever the market maker is forced to trade with an informed trader, the market maker is likely to be entering into a disadvantageous transaction.

The market maker reacts to those losses by widening the difference of the bid and ask prices, i.e., the bid-ask spread. Uninformed traders trading with the market maker "reimburse" his losses to informed traders and bear the costs of informed trading in a more tangible way—as a wider bid-ask spread—but are further removed from the informed traders. The correlation between the bid-ask spread and the profits of informed traders indicates that market makers provide traders with a way to extrapolate or approximate their transaction costs that are attributable to their trading without information.

The financial literature on market makers is rapidly expanding. See generally Lawrence R. Glosten & Paul R. Milgrom, *Bid, Ask and Transaction Prices in a Specialist Market with Heterogeneously Informed Traders*, 14 J. FIN. ECON. 71 (1985) (bid-ask spread widens to reflect information imbalances); John P. Gould & Robert E. Verrecchia, *The Information Content of Specialist Pricing*, 93 J. POL. ECON. 66 (1985); ROBERT A. SCHWARTZ, *EQUITY MARKETS: STRUCTURE, TRADING, AND PERFORMANCE* 92-95, 387 (1988).

insiders lead it by \$2.⁴⁶ Inserting more trading instances and dividing the groups into their individual members does not change the above conclusion. If the outsiders traded only among themselves, their group would have followed the market's performance, regardless of whether some of the members would exceed and some would trail the market.

That insider trades are lost in a crowd of outsider trades does not eliminate their effect. The fact that the transactions that cause the losses of outsiders are few and difficult to discern among a plethora of innocent transactions gives the losses of outsiders a statistical nature. Outsiders who trade need not know whether they have traded opposite an insider, but they do know that they are likely to underperform the market more for every trade they make, specifically by the amount of insiders' profits divided by the total number of outsider trades. This expected loss per outsider trade is the transaction cost of trading without information.⁴⁷

2. Informed Versus Uninformed Traders

The exposition of the previous subsection, which used insiders as the group whose profits generated the transaction costs of outsiders, must be expanded. Instead of taking the definition of insiders as given, the sum of traders who, by using information, outperform the market ("informed traders") are the source of the transaction cost of the rest ("uninformed traders").⁴⁸ The division of traders into informed and

46. The performance of outsiders can be tracked more closely. They started with \$90. They had to "borrow" \$5 to buy the insiders' sales. Their wealth stays at \$90, while their holdings increase to \$95. After the 20% drop, their \$95 is reduced to \$76, and their wealth is \$76 minus the \$5 debt, that is, \$71. After the sales to insiders, their holdings are reduced to \$68 with \$8 of proceeds and \$5 of debt, resulting in a wealth of \$71. After the market returns to \$100, outsiders' holdings increase to \$85, plus \$3 in cash after the \$5 debt repayment, for a total of \$88. Outsiders are worse off by \$2 than if they had not traded.

47. The transaction cost of trading opposite insiders who report their trades under § 16 of the Securities Exchange Act of 1934 has been calculated. See H. Nejat Seyhun, *Insiders' Profits, Costs of Trading, and Market Efficiency*, 16 J. FIN. ECON. 189, 200 (1986).

Seyhun divided firms into five groups based on size of equity. Despite the higher profitability of insider trades in the smallest group, that group is not the one presenting outsiders with the highest likelihood of trading opposite an insider. Seyhun determined that the likelihood of trading opposite a reporting insider starts at 3.6% for the issuers under \$25 million; peaks at 4.5%; and, as shareholder equity passes the \$50 million mark, abruptly drops to 1.9%, 1.1%, and 0.8% for corporations with over \$50, \$250 million, or over \$1 billion of equity. *Id.* at 200-01. The finding that the insiders of the smallest firms make more profits with less trades than those of the next size is in harmony with the explanation of this Article if the smallest firms' illiquidity does not sustain profitable informed trading to compete with the insiders.

48. A different categorization would seek to distinguish rational from irrational, or erring, market participants, who make the market susceptible to fads or bubbles. Irrational traders are

uninformed is necessary in order to examine how different definitions of insider traders will affect the transaction costs of the uninformed and any social welfare that might flow from lower transaction costs and higher liquidity.

Since informed traders were defined as the traders who outperform the market, the setting of informed versus uninformed changes very little from that of the previous subsection which compared the performance of insiders and outsiders. Again, the disadvantaged uninformed traders will participate in the market less during price rises and more during price drops. (Economists call this phenomenon "adverse selection"). At the end of any period, uninformed traders trail the market's performance by the amount that informed traders have outperformed the market.⁴⁹ Perceiving the profits of informed traders as a transaction cost burdening the rest is the premise of this Article's thesis. Given this transaction cost, the issue is whether regulation—call it "insider trading" rules—can decrease this cost and whether this regulation is justified.

B. Monopolistic and Competitive Informed Trading: The Prohibition of Insider Trading as a Reduction of Informed Profits

Although it may seem intuitive that banning the trading of a certain subgroup of informed traders (by defining them as "insiders" and disallowing "insider trading") may reduce the profits of informed traders, the complexity of the financial markets does not allow us to jump to such a conclusion. The prohibition against certain members of the class of informed traders may simply increase profits to the rest of the class, leaving the transaction costs borne by uninformed traders unaffected or even enlarged.⁵⁰ The primary issue, however, is to see how the optimal rule on insider trading would reduce the "adverse selection" transaction cost of uninformed traders. The prohibition must cover the informed traders who have the capacity to trade strategically.

irrelevant to the discussion of insider trading. Irrational trading, from a regulatory perspective, is countered by disclosure, which subsidizes rational traders. See Georgakopoulos, *supra* note 5, at 248-94.

49. The distinction between informed and uninformed may be more intuitive if it is used to categorize trades instead of market participants. It is unlikely that any trader or investor can trade exclusively on superior information (or superior analysis).

50. Along these lines, commentators have argued that the insider trading rules favor market professionals, who reap the profits that the law prohibits the insiders from taking. See Carney, *supra* note 6, at 897; Haddock & Macey, *supra* note 6, at 1458-59; Jonathan R. Macey & Geoffrey P. Miller, *Toward an Interest-Group Theory of Delaware Corporate Law*, 65 TEX. L. REV. 469 (1987).

1. An Example of Regulating Informed Trading with Uninformed Trading Kept Constant

Assume different classes of informed traders who participate with numerous uninformed traders in a market for a single security of constant liquidity. The volume of uninformed trading is constant and is not expected to move prices. The different classes of informed traders differ in the speed with which they reach information and in the competition that they face. Thus the first class of traders faces no competition,⁵¹ while each subsequent class faces not only the competition of the members of the previous classes but also has more competing members itself.

Competition influences the trading decision of informed traders. A monopolist trader can expect to be able to trade repeatedly on the same piece of information. By contrast, a trader who faces competition from other informed traders in the transformation of information into trading profits knows that prices will soon reflect the information, thus precluding repeated profitable trades. Competition decreases the number of trades that can be made on the information.

Imagine that prices correct by \$1 for every 100 shares traded.⁵² The market's liquidity is such that purchasing 100 shares raises the price by \$1. Thus a trade of size ts will be executed at a price P_t , which will be a function of ts and the previous price, P_0 .⁵³

51. This group can be understood as a single CEO who creates information with her actions. No one else has the information or competes for any profits that can be made on it. A cohesive group of corporate directors could have similar dynamics.

52. Although the liquidity of the market is not constant, informed trading, provided it is not detected, would not reduce liquidity. Therefore, the assumption that trades have the same impact on prices throughout the course of trading in this analysis is realistic and correct. There is no reason why, as the competition among informed traders increases, they would reveal their identity (and lose profits).

53. A more explicit and formal representation (calling the reaction of prices to trading g and allowing non-linearity by raising the trade size ts to the power w , so that slightly more complex reactions of prices to trades can be represented) would be

$$P_t = \begin{cases} P_{t-1} + g * ts_t^w & \text{if } ts_t \text{ is positive (purchase)} \\ P_{t-1} - g * |ts_t|^w & \text{if } ts_t \text{ is negative (sale)} \end{cases}$$

under the constraint that, obviously, $g > 0$, but also that $w \geq 1$. If w were to be smaller than 1, then large trades would move prices less than proportionately small trades. Such a situation would be undesirable to the market maker because he would be inviting consolidation of small trades into large trades by, and consequently large losses to, informed traders.

This formula is a customary starting point for financial modeling of the market. See, e.g., Admati & Pfleiderer, *supra* note 12; Kyle, *supra* note 12. In fact, market makers do not use

$$P_I = P_o + .01 \ ts$$

The shares are presently priced at \$100, and information indicates that their value is \$120. Consider the strategy of a perfectly competitive trader, i.e., one who does not expect to trade again on this information. He will seek to maximize his profits from this single trade. His profits consist of the distance from true the value of the price at which he trades multiplied by the number of shares he buys. If we name the price at which he will trade P_I , true value TV , and the size of his trade ts , his profits can be expressed mathematically as:

$$Profits = (TV - P_I) \ ts$$

or after substituting the function for P_I :

$$Profits = (TV - P_o) \ ts - .01 \ ts^2$$

The perfectly competitive informed trader will now maximize his profits taking the first derivative of their function with respect to his trade (ts) and equating it to zero:⁵⁴

$$\frac{dProfits}{d \ ts} = (TV - P_o) - 2 * .01 \ ts = 0$$

$$20 - .02 \ ts = 0, \text{ therefore, } ts = 1,000.$$

The fully competitive informed trader would buy 1,000 shares. That would correct prices by \$10, half-way to correction. A second trade by another competitive trader would consist of a purchase of 500 shares and would push price up another \$5 to \$115, for a total profit of \$12,500 for informed traders.

any formula, and any attempt to approximate their strategy for moving prices in response to trades would be very complex. This function, however, is a fair approximation, because it captures in its simplicity the adverse effect that traders expect to have on prices without sacrificing much realism. Compelling empirical proof that trades move prices as a function of their size exists. See Jerry A. Hausman et al., *An Ordered Profit Analysis of Transaction Stock Prices*, 31 J. FIN. ECON. 319, 357 (1993) ("trading a larger quantity [of stock] always yields a larger price impact."). For an empirical work using a closely related function with relative success, see Roger D. Huang & Hans R. Stoll, *Market Microstructure and Stock Return Predictions* (1992) (Working Paper No. 91-26, Vanderbilt University).

54. That will be a maximum because the second order condition holds.

By contrast, the informed trader who does not face competition knows that she may trade repeatedly on the same information. Assume, for simplicity, that her advantage allows her only two trades. It should be obvious that her first trade would never be as large as that of the competitive trader.⁵⁵ If the informed trader knew she could trade twice, her first trade would be smaller than 1,000 shares and would, of course, result in a smaller correction of prices. In her second trade, since it would be her last, she would follow the competitive strategy. In her first trade, however, she is aware that she expects additional profits from her second trade. She also knows that the price before her second trade will be the price that she sets with the first. Her profits in the second trade are influenced by her first. The smaller the first trade, the more profitable her second trade. By not correcting prices, she preserves profits for her next trade. This lighter trading due to a lack of competition will be referred to as "strategic trading." Strategic trading is light trading that does not correct prices as much as trading under competition.⁵⁶ In the facts of the example, two competitive trades would push

55. We already know that her strategy that will determine her trade size in the second trade will be:

$$ts_2 = (TV - P_1)/.02$$

and that price after the second trade will, therefore, be:

$$P_2 = P_1 + (TV - P_1)/2$$

The profits she is trying to maximize are the sum from the profits of both trades:

$$\begin{aligned} \text{Profit} &= (TV - P_1) ts_1 + (TV - P_2) ts_2 \\ &= (TV - P_1) ts_1 + (TV - P_1 - (TV - P_1)/2) (TV - P_1)/.02 \end{aligned}$$

After substituting the formula for P_1 and simplifying, her profits become

$$\text{Profits} = (TV - P_0 - .01 ts_1) ts_1 + \frac{(TV - P_0 - .01 ts_1)^2}{.04}$$

Take the first derivative with respect to ts_1 , equate to 0 and solve for ts_1 (which will, again, be a maximum because the second order condition is met):

$$\frac{d\text{Profits}}{d ts_1} = (TV - P_0 - .03 ts_1) / 2 = 0$$

$$ts_1 = (TV - P_0)/.03$$

The result is that she will maximize profits by trading 666.667 shares in both the first and the second trades. Notice that there is no need for discounting the future profits to their present value because the trades take place immediately after one another.

56. In the complexity of actual securities exchanges, strategic trading would involve placing small orders that are hidden in the order flow, thus breaking a large order into many small ones, or placing limit orders in the middle of the spread so as not to move prices all the way to the market maker's bid or ask. A limit order (as opposed to a market order) is an offer to trade at a given price. Placing a limit order within the market maker's bid-ask spread would involve, for example, offering to sell 200 shares of IBM at \$100 if the market maker offers to buy at \$99 (bid) and to sell at \$100¼ (ask). If there are buyers of IBM on the market, the

price to \$115 at a \$12,500 profit for the informed. The two non-competitive trades push price only to \$113.32, resulting in a larger profit of \$13,333 for the informed trader.

A graphical comparison of the competitive and non-competitive trading strategies shows the effect of regulation. Consider that information is produced after trade 0, is exclusively possessed during trade 1, and is public thereafter, i.e., in trades 2 and 3. For simplicity, assume that prices correct to \$120 at trade 4 (this important assumption will be relaxed in the next stage of this example). The only difference between competitive and non-competitive trading is the time at which trading starts. The informed trader is able to ensure that she will also make the second trade, trade 2 (traders queue, for example, in order to trade, and the exclusive possessor of information on trade 1 queues before the public announcement). If the monopolist informed trader is barred from trading, there will be no informed trade at time 1, but trades 2 and 3 will be competitive. The crucial difference between the competitive and non-competitive trading is the total profits of the informed traders. In every trade the profits are the difference of the price from true value multiplied by the size of the trade. In a three-dimensional graph (time, trade size and price being the axes), this is the product of [price minus true value] multiplied by trade size. Since the trades form a sequence, the total profits over all trades could be called the volume of the solids in the following graph. The difference in their volume is the difference in the traders' profits.

limit order is "filled" and the seller avoids lowering the market price to the bid. The opposite, an aggressive trading strategy, would involve placing large orders, perhaps through the "upstairs" block-trading offices, to be traded at market price, in essence accepting to move price to the disadvantage of the one who initiates the trade as far as the market will require to absorb the large trade. Strategic trading can be conceptualized as "slow" or "passive" trading, in contrast to the "aggressive" trading of traders who face time pressure to complete their trades.

GRAPHICAL REPRESENTATION OF THE TWO-TRADE EXAMPLE

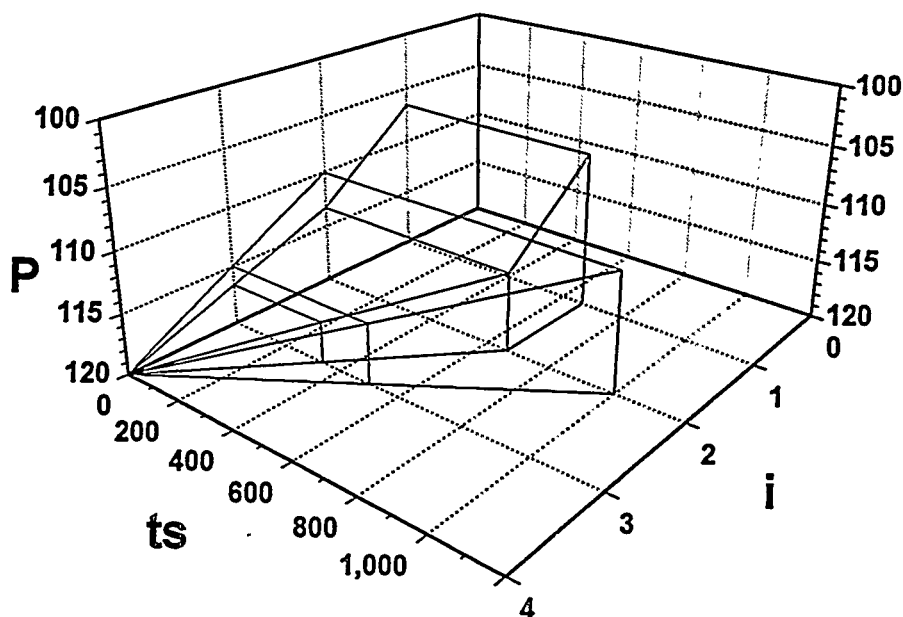


FIGURE 1: This figure allows a visual comparison of the strategies of competitive and non-competitive informed traders in the simplified case where they engage in only two trades each. The i -axis represents the trades in time; the P -axis represents the price at which each trade occurs; and the ts -axis represents trade sizes. Information becomes public at trade 4, and we assume prices correct to \$120 at that time. Information is created after trade 0, but is exclusive during trade 1. The inner solid represents the trading of the exclusive holder of information, who trades at trade 1 knowing that she will be able to also trade at trade 2 on the same information (trade 3 in the inner solid is irrelevant). Notice that trades 1 and 2 have the same size; the trader was not forced to trade intensively in the first trade due to lack of competition. The outer solid is the result of the prohibition of trading to the exclusive holder. There is no informed trading during period 1. We see, however, how competition forces a faster approach of price to true value as traders are forced to take full advantage of each trade separately. The point of the example is that the prohibition of exclusive informed trading reduces the profits of two informed trades from \$13,333 to \$12,500. If the third trade of non-competitive informed traders were calculated, their profits would be even greater. (The third trade would again be competitive and would be $ts=335$, $P=116.6$, for profits of \$1,139, which brings the total profits of informed traders if the monopolist was allowed to trade to \$14,479.)

The difference in the profits of informed traders is only one side of the question of regulating informed trading. The prohibition of insider

trading also causes a delay in "efficiency"—the time before prices reflect the new information. In the previous example price correction was assumed to take place after four trades. This assumption is now relaxed, and price correction is left to the forces of trading. As a slight further modification of the previous example, allow information not to make a direct transition from exclusive to public, but to spread gradually to informed traders according to the different advantages that they may have in getting the information. The trader with the greatest advantage reaches the information first. Knowing that a second trader will soon uncover the information, the first trader rushes to the market and engages in strategic trading as the sole holder of the new information. At some point he is joined by a second trader. For the period during which the first trader was alone he engaged in "monopolistic" strategic trading. Thereafter, the two are "duopolist" strategic traders. Each trades knowing that he will only be able to participate in half the future informed transactions. Still, trades are much smaller than under perfect competition. The extra competition, however, results in slightly larger trades and a faster approach of price to true value. As more traders get the information, more enter, and competition increases. As competition increases, the rate at which price approaches true value increases as well.

As we saw previously,⁵⁷ the trader who expects to trade not only in the current trade but also in future trades seeks to select the trade size that will maximize his total profits. His total profits include not only those from the current trade but also those from his future trades. Traders compete for trades in an environment with little order, where each member of the crowd on the floor competes for the specialist market-maker's attention. It should not be unreasonable to assume that each trader expects to be chosen to participate for each future trade with probability $1/n$, where n is the number of competing traders.⁵⁸

To state this formally, call the total profits of the trader over all trades TP , call current price P_t , and call the last trade before price corrects i_{fin} . The maximization of the total profits, keeping the competition of n traders constant and assuming that $TV > P_t$, is

57. See *supra* note 55 and accompanying text.

58. In this context, the trader involved in the example in note 55, *supra*, knew she was the sole informed trader and was certain that she would complete the next trade.

$$\begin{aligned} \max_{ts_i} TP = & (TV - P_i) ts_i + \frac{1}{n} (TV - P_{i+1}) ts_{i+1} + \\ & + \frac{1}{n} (TV - P_{i+2}) ts_{i+2} \dots + \\ & + \frac{1}{n} (TV - P_{i_{fin}}) ts_{i_{fin}} \quad , \end{aligned}$$

or

$$\max_{ts_i} TP = (TV - P_i) ts_i + \frac{1}{n} \sum_{k=i+1}^{i_{fin}} (TV - P_k) ts_k$$

Already the informed trader's optimization is not solvable, primarily because every subsequent price (i.e., P_{i+1} , P_{i+2} , . . .), which determines future profits, depends on the current trade and all trades between the current and that subsequent trade. It is also not solvable because we cannot derive i_{fin} . Figure 2 is more complex than the above equations in that the number of competing traders (n) changes. The example is also simpler in that i_{fin} is set at 70. Thus, if one more informed trader enters after every tenth trade, the total profit equation at the very first trade of the single informed trader is

$$\begin{aligned} TP = & (TV - P_1) ts_1 + \left[\sum_{k=2}^{10} (TV - P_k) ts_k \right] + \\ & + \left[\frac{1}{2} \sum_{k=11}^{20} (TV - P_k) ts_k \right] + \\ & + \left[\frac{1}{3} \sum_{k=21}^{30} (TV - P_k) ts_k \right] + \dots \end{aligned}$$

Attempting to solve this problem analytically is extraordinarily complex (at least a seventy-equation-seventy-unknown problem). It is easy, however, to derive acceptable numerical solutions.⁵⁹ Figure 2 uses such numerical solutions.⁶⁰

A solution is also found for the case where the single informed trader does not trade. The process is the same, but starts when two traders have the information. This is equivalent to prohibiting "monopolistic" informed trading. The two traders start trading at the time the second trader would enter the market in the previous scenario. Because of the competition between the two traders, price moves toward true value so much faster that there is practically no delay in the time of price correction, although informed trading starts later, since it has to wait for two informed traders. The competition also reduces the total profits of informed traders.

The following figure presents these two scenarios. The inner, longer solid represents the full trading, including the monopolist informed trader. In the outer solid, trading starts only when two traders have the information. Thus, the effect of prohibiting "insider trading" when it is defined as monopolistic informed trading is visualized. The prohibition of trading to the monopolist informed trader (for as long as he is a monopolist) in this example would result in the elimination of large amounts of profit. However, this prohibition would not influence price correction significantly, because monopolistic strategic trading does not correct prices much, a conclusion acknowledged by both theoretical and empirical work in finance.⁶¹

59. For each trade, the trade size that maximizes the total expected profits is found. Then the next trade is optimized. After all trades have been optimized, the process is repeated. When a new pass no longer changes the outcome, the process is terminated.

60. See *infra* p. 29.

61. The notion that insiders will trade strategically has been modeled. See, e.g., Jean-Jaques Laffont & Eric S. Maskin, *The Efficient Market Hypothesis and Insider Trading on the Stock Market*, 98 J. POL. ECON. 70 (1990) (presenting a model under which trading by insiders does not influence prices sufficiently to render prices fully efficient because insiders behave strategically so as to minimize the amount by which they affect market prices); Leonard J. Mirman & Larry Samuelson, *Information and Equilibrium with Inside Traders*, 99 ECON. J. 152 (Supp. 1989) (presenting a model concluding that insiders will trade less than if the market were unable to decode their information, with further citations on the effect of large inside traders on prices). In contrast to this Article, however, these economic models neither reach the breadth of the definition of insider trading, nor show how insider trading regulation may serve to contain the adverse selection problem of uninformed traders.

These theoretical models, as well as the one presented in this Article, are supported inferentially by recent empirical work indicating that insider trading does not result in a full correction of prices and that insiders are able to get better executions for their transactions and even

THE EFFECT OF PROHIBITING MONOPOLISTIC INFORMED TRADING

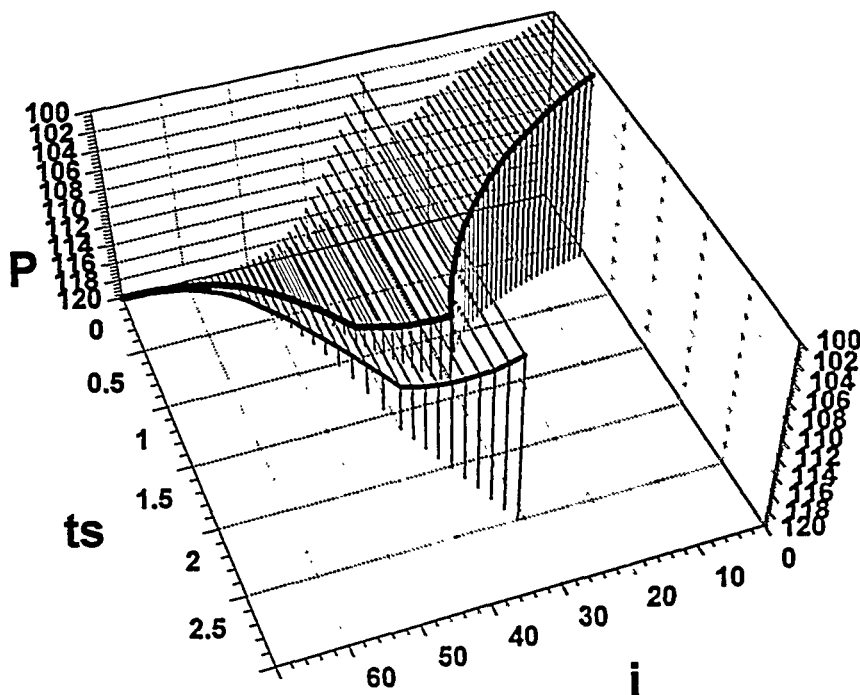


FIGURE 2: P is price; ts is trade size; i is the trade. The number of informed traders starts at 1. One additional informed trader enters at the 31st trade and one more enters every ten trades thereafter. Notice that the lone informed trader trades strategically: his first trades are smaller than his last because he maximizes profits by not moving prices early. The exterior solid represents price and trade size development if the informed traders do not trade unless they have competition. In other words, the exterior solid plots the case where no informed trading takes place when only one informed trader is in the market. The total profits of unrestricted informed traders are 417.41, while the prohibition of the single-trader informed trading almost halves their profits to 258.34. The variables used were $TV=120$, $P_0=100$, $g=5$, $w=1.5$, $i_m=70$ trades. An appendix with the values used for this graph and an explanation of the lack of analytical solutions for $w \neq 1$ is available from the author.

fill limit orders. See Bradford Cornell & Erik Sirri, *The Reaction of Investors and Stock Prices to Insider Trading: The Case of Campbell Taggart* (1991) (Working Paper No. 92-022, Harvard Business School) (examining a single period of insider trading activity in Campbell Taggart; insiders' trades occurred after smaller adverse price moves than those of outsiders, i.e., insiders faced smaller execution costs than outsiders, and insiders were able to use limit orders); Lisa K. Meulbroek, *An Empirical Analysis of Insider Trading and the Stock Market* (1991) (Working Paper No. 92-024, Harvard Business School) (examining a series of insider trading instances and finding that insider trading caused corrections of one third of their post-announcement correction).

This example illustrates that prohibiting trading to a group of traders that can trade strategically costs little in terms of market efficiency, but greatly reduces the profits of informed traders.⁶² Reduced profits for informed traders reduce the "adverse selection" transaction cost that burdens uninformed traders.⁶³

Although figure 2 involves a numerical solution, it is also applicable in a general sense. Furthermore, having a numerical solution is not detrimental. While an analytical solution would allow us to compare the profits of informed traders with and without the prohibition of informed trading, its value would materialize primarily if the above model were sufficiently close to actual trading to allow its conclusions to be applied directly. Since the model is in fact a stylized example, we will have to extrapolate from its conclusions. The numerical solution is sufficient to show the dynamics of the example for this purpose.

In the above examples uninformed trading was held constant. If, however, the prohibition of monopolistic informed trading ("insider trading") reduces the "adverse selection" transaction cost burdening uninformed trading, the prohibition should result in more uninformed trading. The assumption of constant uninformed trading, therefore, must be relaxed.

2. Reducing Transaction Costs in a World of Fluctuating Uninformed Trading

The reduction of the transaction costs that burden uninformed traders (the per-uninformed-trade profits of informed traders) is a problem that feeds back onto itself. Success in reducing these costs increases the volume of uninformed trading. The higher trading volume increases

62. Relaxing the construction of counting time by trades intensifies the conclusion of this example. The notion of strategic trading is even more pronounced than in this mathematical simplification because, in actuality, the same quantity of shares will affect price less if traded over a long period of time. Conversely, more shares can be traded in the process of correcting prices if the trader has more time. Traders who do not face competition usually also have more time to spread their trades. Competition forces not only larger but also more frequent trades. Thus, what seems in the example as equal time in a competitive versus a noncompetitive period, would in fact correspond to unequal time. Ten trades might occupy an hour without competition but would occupy half a minute under competition.

63. In fact, the different classes of traders may have very different numbers of members than in this example. An entire group of executives could act in collusion as the monopolist of the example. A single analyst who is uncertain about his status may actually trade as if he had competition. Using integers for the different classes is an oversimplification since the analyst who has exclusive information but suspects a 50% probability of competition by one more analyst behaves as 1.5 traders in that he expects to reap three quarters of the future profits.

liquidity, which is a reduction in the cost of trading for both informed and uninformed. The cheaper trading drives both groups to trade more and increases the profits of the informed. If the increase in liquidity increased the profits of informed traders proportionately to the increase in the volume of uninformed trading, the "adverse selection" transaction costs of uninformed trading would remain unchanged and insider trading regulation would be pointless. The problem is daunting, but a very similar issue has been answered in financial economic theory.

Puzzled by the phenomenon that trading volume tends to cluster in certain periods of the day, Admati and Pfleiderer explain this clustering with a theoretical model that has received empirical support.⁶⁴ According to their argument, the clustering is to the advantage of uninformed traders because it increases liquidity and it reduces the per-uninformed-trade profits of informed traders (i.e., it reduces the quasi transaction cost burdening uninformed traders). Informed traders are forced to follow because they profit from the increased liquidity. Their profits, however, increase less than proportionately to the increase in uninformed trading. Therefore the adverse selection transaction cost per uninformed trade is reduced. The clustering and its increased liquidity are to the advantage of both.

Without getting into the mathematics of Admati and Pfleiderer's model, it is worth an explanation. When a few uninformed traders happen to trade concurrently, they cause the market to be more liquid at that time.⁶⁵ The increased liquidity causes trades executed at that

64. See *infra* note 66.

65. The models of economic theory do not talk about liquidity but about depth, i.e., the amount prices move in reaction to trades. Market "depth" is uniformly considered an element of market "liquidity," although "liquidity" is not an easily definable term. Contemporary attempts differ slightly. Cf. Douglas W. Diamond & Robert E. Verrecchia, *Disclosure, Liquidity and the Cost of Capital*, 46 J. FIN. 1325 (1991); ROBERT A. SCHWARTZ, *EQUITY MARKETS* 356-57 (1988); Admati & Pfleiderer, *supra* note 12, at 5; Kyle, *supra* note 12, at 1316; Marco Pagano, *Trading Volume and Asset Liquidity*, 104 Q.J. ECON. 255 (1989); Marco Pagano, *Market Size and Asset Liquidity in Stock Exchange Economies* 18-20 (1985) (unpublished doctoral dissertation, Massachusetts Institute of Technology).

Notice that the notion of market depth is contrary to the idea that supply and demand are infinitely elastic, which is the foundation of the Capital Asset Pricing Model (CAPM) and the Arbitrage Pricing Theory (APT). Infinitely elastic demand is an infinitely deep market. CAPM and APT can be saved if they are interpreted as applicable to an intermediate, or a long-term, equilibrium. Empirical research has found evidence of sloping demand and supply curves. See LORIE ET AL., *supra* note 41, at 69 (citing numerous empirical studies confirming the effect of large transactions on prices); Lynn A. Stout, *Are Takeover Premiums Really Premiums? Market Price, Fair Value, and Corporate Law*, 99 YALE L.J. 1235 (1990) (building a hypothesis of sloping supply and demand curves); see generally Andrei Shleifer, *Do Demand Curves for*

time to result in less of an adverse price movement. This attracts both informed and uninformed traders. As the market gets more liquid, the informed derive more profits given the same distance of price from true value, which gives them an incentive to further cluster their trading.

The crucial point of the Admati and Pfleiderer model is that as liquidity increases, the profits of informed traders and the number of uninformed trades do not increase in a constant ratio so that the per-uninformed-trade profits of the informed do not remain constant. Admati and Pfleiderer argue that the increased informed-trading profits are actually reduced when measured per uninformed trade. This reduction takes place because the increased profits available to informed traders result in an increase in the competition among the group members. The increased competition is expressed in more aggressive informed trading, which results in faster correction of prices, which in turn reduces informed profits from what they would have been if increased in proportion to the increase in liquidity and uninformed trading.

Nothing argues against generalizing the conclusion of Admati and Pfleiderer to changes in overall trading volume (instead of changes of trading volume within a trading session). By contrast, their mathematical model, although designed to simulate trading during the day, is based on a sequence of auctions and resembles more day-to-day trading than trading within each day. Furthermore, the validity of their model's principles is intuitive and has received empirical support.⁶⁶

Stocks Slope Down?, 41 J. FIN. 579 (1986).

One study found that large trades move prices, but prices return within fifteen minutes to a level that does not allow profits after transaction costs. See Larry Y. Dann et al., *Trading Rules, Large Blocks and the Speed of Price Adjustment*, 4 J. FIN. ECON. 3 (1977). All studies were focused on the New York Stock Exchange, by far the most liquid stock market. *Id.*

66. See Michael J. Barclay et al., *Private Information, Trading Volume, and Stock-Return Variances*, 3 REV. FIN. STUD. 233 (1990). This work offers an empirical verification of the Admati and Pfleiderer model, *supra* note 12. The study involved a comparison of weekends when the Tokyo Stock Exchange was open on Saturdays with weekends in which it was closed. The alternative hypothesis to the Admati and Pfleiderer model, trading noise, was refuted both because the weekly variance did not increase in the longer weeks and because U.S. stocks did not have increased variance if traded in Tokyo on weekends. The theory that both uninformed and informed traders will cluster in markets of great liquidity is upheld by the observation of the low volume and return variance that stocks listed in multiple exchanges have in their secondary exchanges. Volume is concentrated in the more liquid "parent" exchange, where the stock is principally traded. Informed trading also avoids the foreign exchanges with the result of slowing the adjustments of prices to new information, thereby lowering efficiency. Although these observations do not verify the process, i.e., that the decreased efficiency of foreign markets is due to reduced uninformed trading, they do correlate efficiency with volume and liquidi-

For the purposes of securities regulation, the above model indicates that the increase in liquidity attributable to the more vigorous uninformed trading that may follow the reduction of informed profits (due to insider trading rules), will not result in an increase in the profits of informed trading proportional to the increases in uninformed trading. By contrast, the increased liquidity results in increased competition among informed traders which results in a reduction of their profits per uninformed trade.

Commentators have also pointed out that insider trading discourages outsider informed trading because insiders do not leave sufficient profits for outsiders to stay in the business of pursuing information for trading.⁶⁷ The result of prohibiting insider trading is that outsider informed traders are no longer discouraged from pursuing information because the profits of the "insiders"—despite being reduced—are available to them.⁶⁸

3. Coase Theorem Considerations Justifying Insider Trading Regulation

The reduction of transaction costs through regulation is justified because firms face insufficient incentives to reduce transaction costs themselves. Firms face insufficient incentives to reduce their transaction costs, one of which is insider trading, because the effect transaction costs have on share prices is not constant.

Transaction costs burden each shareholder in a different way depending on the length of time that each expects to hold the stock. Ignoring transaction costs, consider a stock that offers shareholders a 10% return. If trading this stock costs 1% of its price, a shareholder who expects to hold it for two years will receive an annual return of 9% after transaction costs (two years of 10% minus two trades at 1%). If the transaction cost is reduced to .5%, then either the value of the stock will rise in the eyes of the shareholder, or he will be able to shorten his holding period to one year, leaving the return after transaction costs constant at 9%. Because the reduction of transaction costs does not become fully imbedded in price but also allows the shortening of the holding period, firms may not receive all the benefits from reducing

ty.

67. See Michael J. Fishman & Kathleen M. Hagerty, *Insider Trading and The Efficiency of Stock Prices* (1990) (Working Paper No. 65, Northwestern University Kellogg Graduate School of Management). Fishman and Hagerty posit that insider trading leads to less efficient stock prices because it deters other traders from collecting information.

68. The same inside information will lead to fewer profits for the competing traders than it would for the monopolist insiders. See Fishman & Hagerty, *supra* note 67.

this cost. The additional benefit of more frequent trading (increased liquidity) which follows the shortened holding period has the nature of a public good, which suggests that regulation must address transaction costs. The incentives for firms to reduce the transaction costs in their shares constitutes a subject in itself, beyond the scope of this Article.⁶⁹

A similar explanation of the insufficiency of corporations' incentives to reduce transaction costs lies in the uneven way transaction costs burden shareholders. Shareholders who expect to hold shares for the long term require little annual expense by the corporation for reducing transaction costs. Short-term holders, however, would be willing to

69. A change in a good's transaction cost will change its price much more if the transaction costs are small than if they are large. The effect of the change will be negligible if transaction costs are high. The reason is that transaction costs influence the decision to invest so that assets that are costly to trade are held for long periods. Any change in transaction costs will be amortized over the long holding period. Thus, if there are several transaction costs of which firms only control a few, then firms perceive that reducing the costs they do control has a negligible effect on price. Firms have insufficient incentives to reduce transaction costs to the optimal level under two primary hypotheses: (1) if firms are not aware that transaction costs influence price more at lower levels, firms will not eliminate them; (2) even if firms know the true correlation of price and transaction costs, they may still reduce transaction costs less than is socially desirable if there is a benefit to society from low transaction costs and market liquidity which firms do not enjoy (in essence, transaction costs are an externality). See Yakov Amihud & Haim Mendelson, *Asset Pricing and the Bid-Ask Spread*, 17 J. FIN. ECON. 223 (1986). Amihud and Mendelson show that the high risk-adjusted returns of small firms — the "small-firm" anomaly of the Capital Asset Pricing Model — is explainable by transaction costs. Small firms have larger bid-ask spreads. Therefore, they tend to be held by investors with longer holding periods, and their returns after transaction costs are discounted for the expected holding period of the investors who tend to hold an asset with such spreads. Those investors are the highest valuing users of the investment with a large transaction cost. At larger spreads, the effect of a decrease in the spread is much smaller than the effect of a comparable decrease in small spreads. The reason is that the holding period serves to amortize the transaction costs. If the transaction costs are large, the holding period is long, and a given change in the transaction costs will be easily amortized because the market price need only be adjusted so as to increase returns by the increase in transaction costs over the entire holding period. If the holding period is short, a given change in the transaction costs would almost fully reflect on the price and the expected return, because the price would have to adjust so as to provide the same after-transaction costs return. These transaction costs, however, can only be spread over a small holding period. Amihud and Mendelson test their return-to-spread relationship hypothesis by comparing the statistical explanation (regression) of the risk adjusted returns by the bid-ask spread to the statistical explanation of the risk adjusted returns by firm size. While the bid-ask spread has a very strong effect on excess returns, the addition of the firm size to the statistical explanation of the returns has a negligible effect.

George Constantinides attempts to determine the relation of the "liquidity premium" demanded for holding an asset and its transaction costs. As traders hold the asset for longer periods with higher transaction costs, the maximum liquidity premium is much smaller than the transaction costs. See George M. Constantinides, *Capital Market Equilibrium with Transaction Costs*, 94 J. POL. ECON. 842 (1986).

spend handsomely on reducing transaction costs. Thus, shareholders divide. The long-term holders will accept the least expenditure to reduce transaction costs offered to them, and that offer will be made by the shareholders whose shares have the median holding period.⁷⁰ The needs for reduced transaction costs for short-term holders will only be addressed by regulation.⁷¹

C. *Toward the Optimal Insider Trading Rule*

When the prohibition of insider trading is understood as the prohibition of monopolistic informed trading, it loses many of the undesirable effects—primarily the loss in efficiency—that are associated with the prohibition. The definition of insider trading, however, is a question of degree. Part II showed that the law on insider trading can be and has been interpreted with very different results as to its breadth. Similarly, in the context of the previous paragraphs, the issue is how many traders are still facing insufficient competition so as to justify prohibiting their monopolistic strategic trading. The breadth of this definition must be optimized. Furthermore, in order for the regulation to have the flexibility to adapt to the evolving markets, we must determine which characteristics of a market should be taken into account when determining the optimal breadth of this definition. The next sections explain the value derived from the reduction of the uninformed traders' cost of trading, examine the costs due to an excessively broad definition and prohibition of insider trading, and conclude that the optimal insider trading rule must be correlated with the liquidity of the regulated market.

70. Imagine three shareholders: a long-; a medium-; and a short-term investor. The short-term investor proposes large expenditures for the reduction of transaction costs, and is rejected by the other two. The long-term shareholder is also in the minority when offering his low expenditure plan. The medium-term holder's plan, however, will be favored by the long-term holder against that of the short-term holder. It will also be the favored compromise for the short-term holder, but this will not lead to a satisfactory situation given his holding period.

71. A clientele effect, by which funds are distributed to investments with transaction costs that correspond to the period for which the funds will remain invested, is possible and probably exists. Nevertheless, the disadvantageous treatment of short-term shareholders will persist and will push them to switch to investments with smaller transaction costs. After the shortest-term investment leaves a firm, the decision to reduce transaction costs is repeated, and the median-length holder may be longer, which will lead to a further increase in transaction costs.

1. The Benefit of Reducing the Profits of Informed Traders: Cheaper Uninformed Trading

Previously, this Article showed that the prohibition of insider trading reduces the "adverse selection" transaction cost that burdens uninformed traders.⁷² This section shows that there is value in this reduction. Uninformed trading is not only beneficial but also unavoidable. Uninformed trading is beneficial primarily because it increases trading volume and, consequently, liquidity. More liquid markets offer the equivalent of lower transaction costs for trading securities, leading to higher prices,⁷³ more flexible investment possibilities, and less costly portfolio rebalancing. Uninformed trading also allows the securities markets to avoid the trap of the "efficiency paradox."⁷⁴ Finally, trading without information may well be unavoidable: even the traders who purchased as informed traders may have to liquidate their holdings without having superior information.

a. *The Benefit of Increased Volume as Liquidity and Low-Cost Trading*

Increased trading volume expands what is intuitively known as market liquidity. The frequency and quantity of trading that axiomatically follows high trading volume means that the market can absorb (a) larger trades, (b) in less time, and (c) with less adverse price movement than a low-volume market. That a market with high volume will absorb

72. See *supra* notes 45-66 and accompanying text.

73. See *supra* note 69 on the effect of transaction costs on prices.

74. The efficiency paradox is the situation in which a market breaks down for lack of trading as it approaches perfect efficiency because trading will cease. As all traders become perfectly informed, they no longer trade because the prices, reflecting perfectly their information, are no longer advantageous. The efficiency paradox puzzled economists until the notion of uninformed trading was sufficiently developed. Thus, informed traders are no longer considered as trading opposite each other. Instead, they step in to trade opposite uninformed traders who, in essence, pay the price of the transaction cost explained in the text. This solution to the efficiency paradox is both intuitive and likely. If, in fact, informed traders can only trade among themselves, there has to be a difference in the two sides' valuation of the object of the transaction. Further, the profits available to informed traders are minimal and no longer repeating, because in a transaction between disagreeing informed traders only one is correct, if any. Lack of sufficient profits will fail to sustain the activity of informed trading. See Sanford Grossman, *On the Efficiency of Competitive Stock Markets Where Trades have Diverse Information*, 31 J. FIN. 573 (1976); Paul C. Pfleiderer, *Private Information, Price Variability and Trading Volume* (1992) (unpublished Ph.D. dissertation, Yale University) (uninformed trading solves the efficiency paradox); see also Ronald J. Gilson & Reinier H. Kraakman, *The Mechanisms of Market Efficiency*, 70 VA. L. REV. 549, 622-26 (1984).

larger trades than a market with low volume is intuitive — after all, a large trade is but a bundle of smaller trades. A large trade in high volume is more likely to be filled, i.e., more likely to find buyers or sellers. The same intuition lies behind the speed with which a high-volume market absorbs a large trade. Even if the large trade is broken into smaller trades, they will be filled sooner in a market with frequent trading. Similarly, if trading is frequent, a trade that cannot be executed at the current price can find a counter offer by a small price concession. If trades were rare, a larger discount (or premium) would be necessary to entice market participants to trade opposite the large trade. These effects of volume on the aspects of liquidity are, in fact, indistinguishable. All other things being equal, higher trading volume reduces the time and adverse price movement necessary to execute a large transaction. With less volume, even small transactions may require time and price concessions. Thus, increased volume leads to increased liquidity, meaning less of an adverse effect on price by trading. This is a reduction in the cost of trading for all market participants, informed and uninformed.

b. *Avoiding the Efficiency Paradox*

The efficiency paradox states that a market will fail, i.e., trading will stop, when prices perfectly reflect information. As the market approaches efficiency, trading will cease.⁷⁵ The theory of the efficiency paradox assumes that trading is only motivated by information. The efficiency paradox thus rests on the notion that market participants are all speculators. However, the presence of the “uninformed” traders, also known as “liquidity” traders because their trading is motivated by liquidity needs, averts the efficiency paradox. Once traders whose motivation for trading is other than taking advantage of superior information participate in the market, their trading causes fluctuations in supply and demand or in prices. These deviations allow informed traders to trade without having to trade opposite other informed traders. In essence, informed traders stand by and match uninformed trades. The compensation of informed traders is the amount that prices have to move from the level informed traders perceive as accurate before informed traders will correct the prices. The amount by which the trades of uninformed traders move prices is determined by market liquidity.

75. See Sanford J. Grossman & Joseph E. Stiglitz, *On the Impossibility of Informationally Efficient Markets*, 70 AM. ECON. REV. 393 (1980).

c. *Unavoidability of Uninformed Trading*

Even informed traders may not be able to have information at both ends of their transactions. Informed purchasers may be forced to liquidate their holdings without information. Informed short-sellers may be forced to buy back and cover their position without information.⁷⁶ To the extent that even informed traders expect to be uninformed at the other end of their round-trip transaction (the sale, say, that will at some point follow the purchase), even informed traders are sensitive to the transaction costs of trading without information. A reduction in the cost of trading without information leads to a reduction in the cost of informed trading as well. If insider trading regulation leads to the above-described benefits, it is desirable, provided that it does not generate even larger costs. The following section examines these possible costs.

2. *The Costs of Regulating Informed Trading*

A prohibition of insider trading costs more than the administration and enforcement of rules and regulations. The reduction of the uninformed transaction costs comes at the cost of a reduction in the participation of informed traders in the markets. While subsection III(A) argued that the unfettered participation of informed traders generates transaction costs, the insufficient participation of informed traders also has its negative effects. The optimal regulation of insider trading is the result of determining the optimal amount of informed trading. The loss of efficiency due to an excessively wide definition of insiders consists primarily of the delay it imposes on information reaching the market, but it may also cause some misallocation of information-pursuit.

The undesirable effect of insufficient informed trading is a reduction in market efficiency. While the transaction costs of uninformed trading are also being reduced, market efficiency is reduced as the definition of insiders is widened. As we move from no prohibition to the optimal insider trading prohibition, the transaction costs for uninformed traders

76. Short sellers sell borrowed shares, hoping their price will fall, so that they will buy the shares back (and return them) at a lower price than that at which they sold. Their profits consist of the amount by which the short sold shares fell before the repurchase. Restrictions on short sales may easily force short sellers to cover their positions early. For a typical example of an informed short seller who was forced to buy back at a disadvantageous time, see *Zlotnick v. TIE Communications*, 836 F.2d 818 (3d Cir. 1988). Zlotnick sold short a subsidiary of TIE. He had to buy back and cover his position at a loss. The court held that he could not use the fraud-on-the-market presumption of reliance on TIE's misrepresentation because his short selling had manifested his disbelief in market "integrity," meaning that Zlotnick did not believe prices to be unaffected by misrepresentations. *Id.* at 821-23.

are greatly reduced, but the efficiency of the market is reduced only marginally, if at all. As the definition of insiders is widened further, however, the groups of informed traders who would reach new information sufficiently early while facing enough competition to correct prices rapidly are barred from trading. While the costs of uninformed trading may fall, the loss in efficiency may outweigh the gains of reduced transaction costs.

The ultimate excess in the prohibition of insider trading is to prohibit all informed trading. The undesirability of such a regime is obvious: information no longer reaches the markets. Markets without information can hardly further the optimal allocation of resources. Thus, the cost of too wide a prohibition of informed trading is the reduction in efficiency.

Section III(B) showed that the prohibition on insider trading had little effect on the efficiency of the market. The example compared how price approaches true value after a new piece of information is created under two alternative scenarios, one with no insider trading rules and one with a prohibition of trading by any informed trader not facing competition. In the unregulated scenario prices started correcting earlier. In the scenario where the first trader had to wait for a second competitor before trading, the start of the price correction was delayed. Nevertheless, prices corrected fully in approximately the same time under both scenarios. In that sense, since the time to price accuracy did not change significantly, the prohibition of monopolistic informed trading was considered not to influence market efficiency adversely.

Using the same example, we could widen the prohibition of insider trading by monopolist informed traders to include duopolist informed traders. Now prices take longer to correct by approximately eight trades:

SIMULATION OF THE APPROACH OF PRICE TO TRUE VALUE
UNDER ALTERNATIVE INSIDER TRADING REGIMES

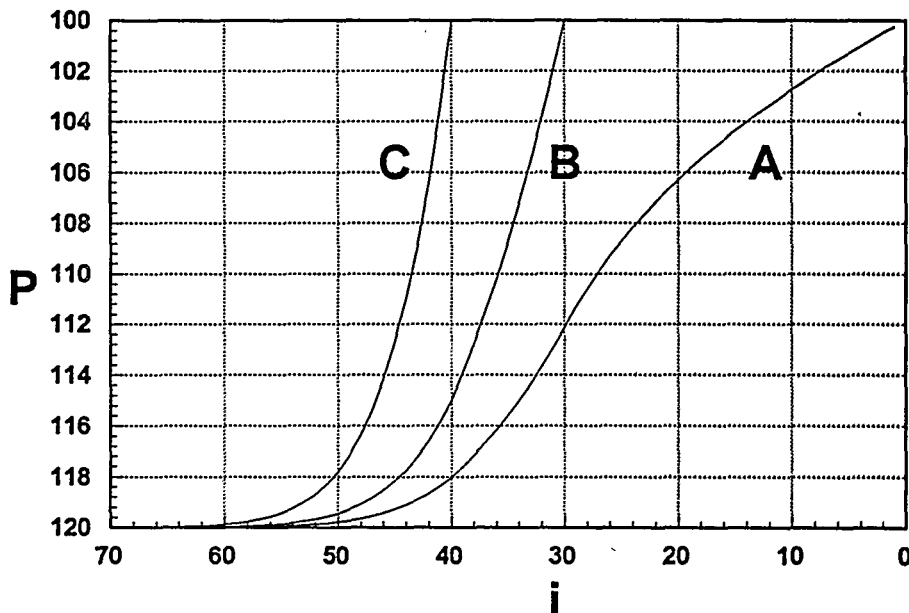


Figure 3: This graph expands from Figure 2. The graph depicts the approach of price to true value under three different scenarios: unrestricted informed trading (line A); prohibited monopolistic informed trading (line B); and prohibited mono- or duopolistic informed trading. Notice that A and B "touch" true value at the same time, while C touches with a delay of about 8 trades. If efficiency is measured by the time until new information is fully reflected into price, A and B are equally efficient.

While efficiency is reduced by broadening the definition of insiders, the total profits of informed traders continue to decline. No prohibition, we saw, results in total informed trading profits of \$417.41. Prohibiting trading by lone informed traders reduces profits to \$258.34 with no delay in efficiency. Widening the prohibition to two traders cuts profits to \$213.43 while prices correct eight periods later. Are the forty-three units saved by the broader prohibition worth more than an eight-period delay in efficiency? Financial economic theory is not yet able to answer this question.

Authors in the legal field have questioned strongly what they perceive as excessive pursuit of efficiency by securities regulation.⁷⁷ Fi-

77. See Lynn A. Stout, *The Unimportance of Being Efficient: An Economic Analysis of Stock*

nance theory, not surprisingly, makes the opposite argument — that markets for equity securities are disproportionately less efficient than markets for debt, while it is accurate equity prices, not debt prices, that primarily promote optimal allocation of resources and optimal managerial incentives.⁷⁸

Insider trading rules, however, hide one more unresearched cost: they may derail the efforts of traders to pursue information. In unregulated markets, the trader who reaches new information first is the one who “brings” it to the market. Different traders may have an advantage with different types of information. Ultimately, each type of information will be brought to the market by the trader who faces the least cost in doing so. Thus, the effort of pursuing information is allocated optimally. A prohibition of insider trading may interfere with this optimal division of information pursuit. Imagine that all the traders having an advantage with respect to a specific type of information are barred from trading. This type of information is now open for the rest. Maybe this will cause a class of information pursuers to switch to this new type of information. The prohibition of trading results in delays in two types of information, the one directly affected by the prohibition and the one that was abandoned to pursue the information that the prohibition made available. This misallocation of information pursuit is a secondary—and admittedly stylized—potentially undesirable effect of insider trading rules.

Once the costs of the excessive prohibition of insider trading (i.e., the reduction in efficiency, and the potential misallocation of information pursuit) are understood, the stage is set for the determination of the optimal insider trading rule. The key is that insider trading rules are beneficial if they eliminate profits of groups of informed traders who would not correct prices sufficiently. Those informed traders do not offer the service of efficiency to the market. By contrast, their profits are a deadweight loss, in the form of a transaction cost, to all other traders.

3. The Optimal Insider Trading Rule

Market Pricing and Securities Regulation, 87 MICH. L. REV. 613 (1988); see also William K.S. Wang, *Some Arguments that the Stock Market is Not Efficient*, 19 U.C. DAVIS L. REV. 341 (1986).

78. Andrei Shleifer & Robert W. Vishny, *Equilibrium Short Horizons of Investors and Firms*, 80 AM. ECON. REV. 148 (papers and proceedings 1990) (high efficiency and sensitivity of short-term financial instruments leads managers to be predominantly concerned with the short term).

The history of the regulation of insider trading shows that the extensive prohibition is relatively recent — only thirty years old in the United States, and at most fifteen in other jurisdictions.⁷⁹ Since insider trading regulation has not always been considered necessary, we should inquire whether the attributes of securities markets that have changed during this period determine when insider trading rules are justified. Furthermore, since the breadth of the definition of insider trading can be adjusted, this search should lead us to the characteristics of the regulated market that should influence the definition of insider trading.

The determinant of the benefits and costs of insider trading rules is liquidity. A liquid market will benefit significantly from the prohibition of insider trading because first, liquidity attracts informed traders and ensures that sufficiently competitive groups will replace the banned "insiders," and second, liquidity makes strategic trading easier and more profitable, meaning that the insiders can perform more trades at incorrect prices before correcting them. Liquidity thus means large profits for informed traders and great social gains from regulation that may reduce these profits. Finally, liquidity, particularly to the extent that it is followed by efficiency, reduces the cost of uninformed trading. It is the plethora of uninformed trading that justifies the reduction in its cost through insider trading rules. Furthermore, liquidity is a lower cost of trading. The reduction of already low transaction costs has stronger effects, both as a reduction of the firms' cost of capital and as a shortening of the traders' holding periods (a trading volume increase), than a proportional reduction of larger costs.⁸⁰

Conversely, an illiquid market may not be hurt at all by the absence of rules on insider trading. The illiquidity of the market drives informed and uninformed traders away. Even the little trading of the insiders in this illiquid market will move prices so they reflect more information. In this situation, insiders will not be able to trade in quantities that allow them large profits and burden uninformed traders with large costs per uninformed transaction. Therefore, regulating in-

79. The UK regulated "insider dealing" in 1980 (in anticipation of stock market "big bang"?); Japan in 1989; Switzerland in 1988; Hong Kong in 1989; France in 1967, 1983, 1988, and 1989; Germany in 1970, 1976, and 1988; the Netherlands in 1989; and the EEC in 1989. See generally Michael D. Mann & Lise A. Lustgarten, *Internationalization of Insider Trading Enforcement—A Guide to Regulation and Co-operation*, in *EUROPEAN INSIDER DEALING* 339 (Klaus Hopt & Eddy Wymeersch eds., 1991); Eddy Wymeersch, *The Insider Trading Prohibition in the EC Member States: A Comparative Overview*, in *EUROPEAN INSIDER DEALING* 65 (Klaus Hopt & Eddy Wymeersch eds., 1991).

80. See *supra* note 69.

sider trading may not be justified because its object—the informed profits—is small. Finally, the illiquidity transaction cost in such a market is so high that holding periods are long; changes in transaction costs have little effect on both the cost of capital or volume. An effort to reduce transaction costs appears pointless.

A range of possible definitions of insider trading might extend over increasingly large groups of informed traders. For the sake of abstraction, one can imagine alternative definitions of insider trading reaching a single trader, or reaching that one and, say, another two, or finally, reaching these three and another three, and so on. Each successive group would acquire information later. Depending on market liquidity, the definition of insider trading should be set so that the first group to avoid “insider” status is sufficiently competitive and large to correct prices and is unable to trade strategically, while all “insiders” will be prohibited from trading. Furthermore, the profits of this group should sustain its activity, or its members will exit and the competition will again be insufficient.

If the definition of insider trading is set imperfectly under the paradigm of this pyramid of informed traders, social costs will arise. Thus, if the definition of insiders is too broad, the first group to be allowed to trade will be so delayed that market efficiency is significantly reduced. Furthermore, the first class of non-insiders may face excessive competition among its members that will erode their profits, fail to support the group, and cause its members to exit. The market will be left with insufficient informed traders to correct the swings in prices caused by the trading of the uninformed. The increasing volatility of the market is a disincentive for risk-averse traders to trade, akin to a transaction cost. The market spirals toward less volume and liquidity without enough informed traders to render it efficient.

If insider trading is defined too narrowly, then traders who face insufficient competition will be allowed to trade strategically before a competitive group reaches the information. The profits of the insufficiently competitive group translate into transaction costs for the uninformed. The resulting reduced trading of the uninformed reduces the market’s liquidity and increases the illiquidity transaction cost for informed traders as well. Further, if insiders do cause some price correction, they eliminate some of the potential profits of the informed outsiders, who may exit informed trading, thus reducing the markets’ efficiency.⁸¹

81. It appears that even small incidents of insider trading cause some price correction. *See*

A different problem arises if the market to be regulated contains an imbalance between informed and uninformed trading. Examining the imbalance of informed and uninformed trading may be a worthwhile diversion since the conclusions of this Article rest upon the unimpeded interaction of the informed and uninformed. Excessive informed trading leads to the "efficiency paradox" of little trading because of perfect pricing.⁸² Some may consider the German stock market an example of such a state.⁸³ Conversely, domination by uninformed traders leads to great liquidity but little efficiency, as the prices move in response to uninformed supply and demand without sufficient informed trading to correct them. An example of this may be the Hong Kong or United States market.⁸⁴ Since both insufficient informed as well as insufficient uninformed trading are undesirable, we should inquire how regulation may assist in bringing those markets into equilibrium. Both appear to be curable with the appropriate disclosure rules, which complement insider trading regulation. Some examples may indicate the process.

Consider, first, a market near the efficiency paradox. It is dominated by informed investors who rarely trade because the accuracy of market prices does not provide them advantageous trading opportunities. Uninformed traders cannot enter, despite the efficiency, because their trading would be misunderstood as informed trading and would cause prices to move excessively to their disadvantage. The puzzle is why informed traders allow such price movements and do not stand by to correct price discrepancies. If the reason is that they face insufficient competition, and therefore their best strategy is to allow such price moves so that they can subsequently trade strategically, then proper disclosure rules could be a solution. Disclosure, by providing free infor-

Meulbroeck, *supra* note 61.

82. For a brilliant theoretical exposition of the problems arising from different mixes of informed and uninformed trading with respect to the efficiency paradox (in the case where informed trading is dominant) and inefficient random prices (in the case where uninformed trading is dominant), see Pfleiderer, *supra* note 74.

83. Inference of the stability of inflation-adjusted prices of the German securities market can be drawn from a work by Edgar Peters which applies alternative methodologies (chaotic or fractal analysis). Mr. Peters finds that the growth-adjusted prices of German securities have "show[n] remarkable stability." EDGAR E. PETERS, CHAOS AND ORDER IN THE CAPITAL MARKETS 167 (1991). Growth-adjustment was used as a proxy for inflation-adjustment of prices because sufficient inflation data was unavailable.

84. Voluminous evidence that the volatility of the U.S. market is unjustified by a present-value model of dividend changes has been produced by Professor Shiller. See ROBERT J. SHILLER, MARKET VOLATILITY (1989) (collecting his earlier work); Robert J. Shiller, *Market Volatility and Investor Behavior*, 80 AM. ECON. REV. 58 (1990); Robert J. Shiller, *Speculative Prices and Popular Models*, J. ECON. PERSP., Spring 1990, at 55.

mation, would enlarge the number of informed traders who would take advantage of the fluctuations in price caused by the uninformed. This would enable the uninformed to trade with less of an adverse price move, allowing an equilibrium of informed and uninformed traders to be reached.

The opposite example, that of a market dominated by uninformed traders, would show signs of great liquidity but little efficiency. Prices would move in response to random shifts in uninformed trading.⁸⁵ The puzzle in this market would be why informed traders do not enter to take advantage of the deviation in prices and render the market efficient. An overbroad insider trading prohibition may well lead to insufficient informed trading. The tax treatment of trading profits, and any regulation imposing excessive costs on aggregations of capital (which would form funds with the power necessary to correct such price moves), are also possible culprits for the insufficiency of informed trading. Another suspect could be insufficient disclosure, which creates a small and insufficiently competitive group of informed traders who allow prices to deviate widely from "true value" so as to maximize the profits they extract in correcting them. In any case, the reason why uninformed traders keep trading, despite the high volatility and despite the market's inefficiency, must also be examined. It may be possible that a fad causes the return from the market to be (or be perceived as) very high, or the risk to be low.⁸⁶ Disclosure may disperse the irratio-

85. See *supra* note 53 (large trades cause short term price moves).

86. The literature on irrationalities has developed significantly since the latter part of the eighties. Different forms of irrationalities cause different reactions to the market. The source of the trouble is that in securities markets, the mix of "rational expectations" agents with the less-than-rational agents results in tendencies away from equilibrium. In other forums it may be possible that the mixing of rational and irrational agents works to the advantage of all. For example, rationals help irrationals (and vice versa) in the context of traffic congestions, because the rational follow uncongested routes, while if all agents were rational they would congest these alternate routes. A third alternative is markets with reputation importance, where either group will dominate. See generally John Haltiwanger & Michael Waldman, *Rational Expectations and the Limits of Rationality: An Analysis of Heterogeneity*, 75 AM. ECON. REV. 326 (1985).

The stock-market-irrationalities literature is increasing. See, e.g., J. Bradford De Long et al., *The Survival of Noise Traders in Financial Markets*, 64 J. BUS. 1 (1991); J. Bradford De Long et al., *Noise Trader Risk in Financial Markets*, 98 J. POL. ECON. 703 (1990) (noise traders create risk, which deters rational traders from taking positions of the size necessary to correct prices); J. Bradford De Long et al., *Positive Feedback Investment Strategies and Destabilizing Rational Speculation*, 45 J. FIN. 379 (1990) (the existence of noise traders that "follow the crowd," as, for example, does portfolio insurance, may induce rational traders to anticipate such trends, enter in their beginning, and initiate them); Kenneth A. Froot & Maurice Obstfeld, *Intrinsic Bubbles: The Case of Stock Prices* (1989) (NBER working paper No. 3091) (building a

nality in prices by subsidizing informed traders and, possibly, disillu-sioning some uninformed traders, so that the rational traders dominate the market.⁸⁷

IV. SUPPORT FROM LEGISLATIVE HISTORY

The notion that the optimal regulation of insider trading is determined by the liquidity of the regulated market is supported by the history and comparative regulation of insider trading as well as by securities regulation in general. Insider trading became an issue for the first time after the crash of 1929, when the market had reached a new level of trading activity. Thereafter, the simple and narrow insider trading rules of section sixteen of the Securities Exchange Act of 1934 sufficed for roughly thirty years.⁸⁸ During the 1960s, as the market again was reaching new volume and liquidity levels, Rule 10b-5 began to be interpreted as a rule against insider trading. The new, but poorly understood, evil of insider trading was sought to be regulated ever more tightly in the 1970s, as the "equal access" theory began to take the foreground.⁸⁹ The "equal access" theory, however, was put to rest by the United States Supreme Court in *Chiarella v. United States*.⁹⁰ The upper boundary on the breadth of an insider trading prohibition had perhaps been reached. The retreat of the "equal access" theory and its substitution by the slightly narrower and much better defined "misappropriation" and mail and wire fraud theories as bases for insider trading liability can be seen as a retreat from the previously excessive prohibition of informed trading.

International comparisons offer the same conclusions. Of all the

model of bubbles based on the rate of increase of dividends, which accurately matches the historical path of stock prices); Kenneth E. Froot et al., *Herd on the Street: Informational Inefficiencies in a Market with Short-Term Speculation* (1991) (unpublished manuscript, on file with author) (1991) (developing a model where pursuing one type of information and disregarding another may be the dominant strategy, creating a market efficient as to the former information and inefficient as to the latter).

87. I develop the role of disclosure rules as a disillusionment of the irrational and a subsidy to the rational traders in a different context. See Nicholas L. Georgakopoulos, *Disclosure Rules as a Measure against Irrationalities* (Sept. 1, 1993) (unpublished manuscript, on file with author); Georgakopoulos, *supra* note 5.

88. Section 16 of the Securities Exchange Act of 1934 prohibits round-trip trades within six months by directors and officers. Their profits are recoverable by the corporation. Section 16 also imposes filing after all trades of insiders. 15 U.S.C. § 78p (1988). See *supra* note 17.

89. For an explanation of the "equal access" theory, see *supra* note 25 and accompanying text.

90. 445 U.S. 222 (1980). The Supreme Court reversed the most unambiguous expression of the equal access theory set forth by the lower court. *Id.* at 231-35.

countries with stock exchanges, the United States, having the most liquid exchanges, was the first to institute new and stricter insider trading rules. Countries with illiquid exchanges, on the other hand, seem never to have shared the regulatory concern of the United States.

The SEC's drive for international cooperation in securities regulation can also be plausibly explained in terms of the hypothesis presented by this Article. The internationalization of securities markets often means that the same securities are traded in more exchanges, possibly contemporaneously, despite differences in time zones. Evidence indicates that for each security traded in several markets, the original, primary market in which the security is traded often remains the most liquid market.⁹¹ If a certain trading practice is illegal according to the forum of the primary market, traders can flock to other markets having more relaxed regulation. As long as there are no arbitrage possibilities that would correlate the prices in both markets, there is little wrong with this regulation-evasive trading. The insiders who trade in the illiquid market will move prices or, having driven uninformed traders away, will be unable to find trading partners. When both exchanges are open contemporaneously, however, arbitrage will furnish the insiders at the second exchange with trading partners and liquidity that is transferred, essentially, from the primary exchange. While this increased trading activity is not to the disadvantage of the illiquid market, it costs the liquid market almost as much as a repeal of its securities regulation. The costs per trade of uninformed traders will rise. As a result, the picture presented in this Article unravels. It is only natural that the SEC has been concerned about international cooperation in regulation of securities markets. What is surprising is that the less liquid exchanges succumbed to the SEC's pressure.

V. CONCLUSION

This Article presents the notion that the regulation of insider trading both reduces the per-transaction amount that uninformed traders lose to informed traders and increases the competition among informed traders.⁹² Reducing transaction costs leads directly to more efficient mar-

91. See Barclay et al., *supra* note 66.

92. This Article's treatment of insider trading as a transaction cost partially refutes the benefit of insider trading that is traditionally espoused — namely that by impounding more information into prices, insider trading increases efficiency and reduces risk, leading to higher prices. The assumption that securities prices will change to reflect the reduction of risk due to faster incorporation of information in prices is based on the notion that risk accounts for the level of securities prices and their approximate historical return rate of 8% above inflation (the "equity

kets, better allocation of resources, and eventually to a lower cost of capital.⁹³

The current law on insider trading is consistent with the analysis presented in this Article, particularly if we take into account practical considerations. Under the misappropriation and mail and wire fraud theories, one becomes an insider by having such an advantage in getting the information that we can reasonably infer that he would have the ability to trade strategically.

The ideal rule on insider trading should not be a blanket prohibition, but should only delay the trading of insiders. The rule should delay the first classes of traders only until sufficient competition accumulates. Such a "delaying" rule would make a narrower definition of insider trader possible. Imagine that the competition among fewer than three traders was insufficient for a market. In a world where information spreads first to a single informed trader, then to another two, and then to another three, a "prohibitory" rule would ban the trading of the first two classes. A "delaying" rule would only need to postpone the trading of the first class.

The narrower insider trading definition of a delaying rule would also lessen any misallocation of information pursuit caused by insider trading rules. It would allow the market participants with the greatest advantage in seeking information to inject such information into prices. By contrast, a prohibitory rule would force entities with a comparative disadvantage to pursue and bring the information to the market. Not only is the market informed more slowly, but also at a greater expense, particularly if the traders who bring the information would, under the delaying rule, be able to profit by bringing yet more information to the market. Given the practicalities of insider trading regulation, however, a delaying rule does not appear immediately possible. The strictness of the current rule, which requires insiders to wait until the information is public, however, may also be excessive, since it would be better to

premium"). Studies, however, have failed to justify the equity premium by the risk associated with stocks. See Mehra & Prescott, *supra* note 11; Stephen J. Fisher, Asset Trading, Transaction Costs and the Equity Premium (July 1991) (unpublished manuscript, on file with author). In addition to Mehra & Prescott, who point out that risk only explains 0.4% of the 6-8% historical risk premium, Fisher uses transaction costs to justify 4% of the equity premium. *Id.* If the approximately 20% annual volatility fails to explain the 8% equity premium, a marginal decrease in risk due to faster adjustment of prices to inside information, which may even leave the annual volatility unchanged, is unlikely to have an effect on prices sufficient to justify unfettered insider trading, particularly in view of the ensuing increased transaction costs.

93. See *supra* note 69.

allow insiders to trade as soon as their competition does.

Given the present situation, the practicable change that is needed is the correlation of insider trading rules with market liquidity. The stage for such an interpretation is set. The lack of a statutory definition of insider trading is fortunate. As Part II showed, the theories of insider trading liability—the “duty to disclose or abstain” theory, the misappropriation theory, and the mail and wire fraud theory—are each amenable to widening or narrowing interpretations.⁹⁴ The liquidity of the market for the shares of the traded corporation should be the gauge of the breadth of the prohibition in the application of these theories. The liquidity of the market should similarly influence the SEC’s definition of insiders under section sixteen. Although liquidity cannot yet be precisely measured and defined, reasonable proxies for liquidity are the dollar trading volume, the turnover (i.e. the proportion of shares that change hands annually), and the “float” (i.e., the proportion of the equity that is held by the public). The definition of insider trading with respect to shares having great trading volume, large turnover, and large float should be much broader than the definition associated with thinly traded shares having a low turnover, of which the public only holds a small minority.

One can infer from this Article that extraordinary analysts, having such an advantage that they are in essence monopolists, should also be prohibited from trading. If analysts are so skilled that they do not face competition in their trading, the prohibition against monopolistic trading should apply. Belief that one’s information is exclusive should be sufficient to trigger insider trading liability. This addition of a new substantive element of the offense involving the offender’s state of mind would be the first significant departure of the federal insider trading jurisprudence from the common law principle of deceit. By examining the suspect monopolist’s trading, it should be easy to determine whether he traded aggressively, thus believing that he faced competition, or passively, thus establishing *prima facie* evidence that he believed he was a monopolist.⁹⁵ The incentive to trade aggressively that such a

94. See *supra* Part II.

95. Notice that such a new mens rea element may indicate that *Dirks* was wrongly decided since *Dirks* was aware of the exclusive nature of his information. Although this Article’s proposal renders the reasoning of *Dirks* unnecessary, its outcome must still be supported. *Dirks* did try to announce his information and bring it to the SEC’s attention. When a monopolist trader cannot find competition after a certain time and effort in good faith, he must be allowed to trade even as a monopolist. The value of his limited correction of prices and his promotion of market efficiency is sufficient to overcome the adverse-selection transaction cost that his profits

rule would instill upon traders having doubts about their insider status is also desirable, particularly in comparison with the current rules, which give traders the incentive to hide trades and emulate monopolistic strategic trading.

Beyond these recommendations, this Article finds a deeper harmony within securities regulation. Securities regulation consists of numerous specific rules regulating behavior in the financial markets. Two large categories of rules can be discerned. Most rules impose either disclosure or restrictions on trading. Disclosure rules play an integral part in the optimal regulation of insider trading. Regardless of what other purposes may be served by disclosure, it ensures ample availability of information for potential informed traders. The ease of entry into the ranks of informed traders preserves and fosters the competition among the members of the group. Absent disclosure requirements, the competition that insider trading rules foster could fail.⁹⁶

More difficult than harmonizing disclosure with insider trading rules is the harmonization of securities regulation with the regulation of markets for non-financial goods. Strict regulation of markets for certain products is certainly common. The uniform austerity with which all products in the securities markets are treated, however, is striking. While this Article does not attempt fully to explain the disparity, a unique difference in securities markets is the importance of uninformed participants. In markets for real goods, there is less of a need for uninformed participation. Purchasers of non-financial goods tend to be the ones determining the value of the goods through the utility they derive from them. Prices of non-financial goods demanded and supplied in this fashion allocate resources optimally without much need for further regulation.

The importance of uninformed participation seems to be unique to

create. The concern about efficiency in this case will override the concern about the transaction costs of uninformed traders. If, however, the problem of establishing the time and effort spent trying to bring information to the market becomes commonplace, then it justifies economically the adoption of a simple policing structure and the delaying rule. Traders who believe they have exclusive information would announce it to the SEC confidentially and wait until either the SEC informs them that they have enough competition or until the allotted time lapses.

96. The issue of possible barriers to entry is not directly relevant to this Article. It is possible to imagine that processing intricate information may involve barriers to entry. A related justification has been offered for the lack of discretion in the form of disclosure: uniform disclosure is easier to process. See Michael J. Fishman & Kathleen M. Hagerty, *The Optimal Amount of Discretion to Allow in Disclosure*, 105 Q.J. ECON. 427 (1990). Fishman and Hagerty's model favors restricting the freedom of disclosure if there are numerous uninformed parties in the market, whereas complete discretion is favored in markets that have traders with the savvy to interpret different disclosure forms.

the securities markets. Reasons may be many, but they exceed the scope of this Article. One of the most apparent reasons for the need for market participation by uninformed traders (who also personify liquidity) revolves around the fact that securities are priced at two levels. On one level, the total supply of investment capital and its demand set interest rates and risk premiums. Uninformed investors play an integral part in the supply of capital. On another level, uninformed investors do not play any role in the pricing of individual securities. Specific securities will be priced by informed investors, but their existence requires the liquidity and the fluctuations in supply and demand that the uninformed provide. Without this, the market will perish in the efficiency paradox.⁹⁷

97. An appendix to this Article, which solves analytically a 20-trade optimization if $w=1$ and shows why analytical results for w_1 were not obtained, is on file with the author.

